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## Factors Associated with Barriers to Engagement in HIV-Prevention Care among Sexual Minority Men

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### Abstract

**Background:** Engagement with HIV-prevention services varies among sexual minority men (SMM).

**Methods:** 183 HIV-negative SMM completed a baseline assessment including sociodemographic, psychosocial, identity and stigma, and sexuality measures, as well as HIV-prevention behaviors: 1) date of most recent HIV test, 2) whether they discussed HIV or 3) sexual behavior with their provider, and 4) disclosure to provider about engaging in condomless anal sex (CAS). Factor analysis of these four items yielded an HIV-prevention engagement factor score. Stochastic search variable selection (SSVS) followed by multiple linear regression identified variables associated with HIV-prevention engagement.

**Results:** SSVS identified three variables for inclusion in a multiple linear regression model. Not disclosing sexual orientation to one’s provider ( $p < 0.001$ ), discomfort discussing sex with provider ( $p < 0.001$ ) and lower education ( $p = 0.007$ ) were associated with less HIV-prevention engagement.

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#### Author Contributions

Conceptualization and Methodology: Audrey Harkness, Sierra A. Bainter, Steven A. Safren; Methodology: Audrey Harkness, Sierra A. Bainter, Steven A. Safren; Formal analysis: Audrey Harkness and Sierra A. Bainter; Writing - original draft preparation: Audrey Harkness, Noelle A. Mendez, Daniel Hernandez Altamirano; Writing - review and editing: Sierra A. Bainter, Noelle A. Mendez, Daniel Hernandez Altamirano, Conall O’Cleirigh, Matthew J. Mimiaga, Kenneth H. Mayer, Steven A. Safren; Supervision: Sierra A. Bainter, Conall O’Cleirigh, Matthew J. Mimiaga, Kenneth H. Mayer, Steven A. Safren.

#### Ethics & Consent to Participate

Study procedures were reviewed and approved by the Fenway Health Institutional Review Board, which included obtaining written informed consent from all participants.

#### Conflicts of Interest

Dr. Safren receives royalties from Oxford University Press, Guilford Publications, and Springer/Humana press for books on cognitive behavioral therapy. The authors have no relevant financial or non-financial competing interests to report.

#### Availability of Data

Not applicable

#### Declarations

**Conclusion:** Findings suggest the importance of training providers in culturally competent care to mitigate observed barriers.

### Keywords

HIV-prevention; sexual minority men; sexual orientation; disclosure; education

Sexual minority men (SMM), including gay, bisexual, and other men who have sex with men (MSM),<sup>1</sup> have been disproportionately affected by the HIV epidemic since it first began, and currently experience the majority of new HIV diagnoses in the United States (CDC, 2020). To curb the HIV epidemic among SMM, it is important to ensure HIV-prevention services are disseminated and utilized by those who could benefit the most. CDC guidelines recommend that all sexually active MSM be tested for HIV at least once a year and suggest that providers consider offering testing every three or six months based on a patient's behaviors that could lead to HIV acquisition and local HIV epidemiology (DiNenno et al., 2017; US Preventive Services Task Force, 2019). SMM who engage in regular HIV testing in turn have a point of linkage to other prevention services, such as pre-exposure prophylaxis (PrEP), as well as antiretroviral treatment for personal health and secondary prevention if they are diagnosed with HIV.

Despite the importance of HIV-prevention services, these services do not equally reach all SMM, with 29% of MSM in 2014 reporting that they did not receive an HIV test in the past 12 months (Dailey et al., 2017). HIV testing among SMM has been shown to vary based on a variety of factors, such as anticipated HIV stigma (Finlayson, 2019; Golub & Gamarel, 2013; Levy et al., 2014; O'Cleirigh et al., Under Review), extent of sexual orientation disclosure to healthcare providers (Bernstein et al., 2008; Fisher et al., 2018; Petroll & Mosack, 2011), education level (Reilly et al., 2014; Wray et al., 2018), socioeconomic status, (Joseph et al., 2014; Levy et al., 2014), age (Morgan et al., 2017; Noble et al., 2017), and race/ethnicity (Kanny et al., 2019; Mannheimer et al., 2014; Wray et al., 2018).

In addition to engaging in regular HIV testing, there are other medical care relevant behaviors that can assist in allocating appropriate services to prevent HIV acquisition among SMM. Discussing HIV, sexual behavior, and disclosing when one has engaged in sex that could lead to HIV acquisition to one's primary care provider are all avenues through which SMM can become engaged in other HIV-prevention services, including HIV testing and PrEP. For instance, SMM who disclose their sexual orientation identity to their medical provider feel more comfortable discussing their sexual behavior with their provider (Griffin et al., 2020) and are less likely to be denied PrEP by their provider (Furukawa et al., 2020). Physicians are more likely to recommend appropriate healthcare services to their patients when they are aware of their patients' sexual orientation identity (Petroll & Mosack, 2011). These findings suggest sexual orientation disclosure in medical settings could play an integral role in ensuring SMM are optimally engaged in HIV-prevention behaviors within medical settings.

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<sup>1</sup>We refer to gay, bisexual, and other men who have sex with men collectively as "sexual minority men," however, when referencing sources that specifically refer to men who have sex with men (MSM) we use the matching terminology.

To ensure HIV-prevention services reach SMM who may benefit most, it is important to identify factors associated with engagement in an array of HIV-prevention behaviors within medical settings, including HIV testing, disclosing sexual behavior that could lead to HIV acquisition, and discussing HIV and sexual behavior with one's provider. Accordingly, this study sought to identify factors reliably associated with these medical care relevant HIV-prevention behaviors among a group of SMM who reported sexual behavior that could lead to HIV acquisition (based on inclusion criteria defined below) and would therefore *all* benefit from such engagement. The findings from this study can inform implementation and dissemination strategies to engage SMM in medical care relevant HIV-prevention behaviors.

## Method

### Participants and Procedures

The data for this project came from a cohort study to identify acute HIV infections among SMM at an LGBTQ-affirming community health center in New England (see Blashill et al., 2016; Safren et al., 2018). Data were collected between June 2012 and April 2014. Inclusion criteria for the cohort study included: (1) age 18 years or older, (2) assigned male at birth and currently identify as a man, (3) HIV-negative status (confirmed via at-home rapid testing), and (4) self-reported sexual behavior associated with increased odds of HIV acquisition: 1+ instance of condomless anal sex (CAS) with an HIV-positive male partner or male partner of unknown HIV status in the past 6 months; anal sex with 4+ male partners in the past 6 months; exchanging anal sex with a male partner for money, gifts, shelter, or drugs in the past 6 months; or reporting both sex with a male partner and having a sexually transmitted infection in the past 6 months. Exclusion criteria were: (1) currently using PrEP or planning to do so and (2) participating in an HIV vaccine trial (or prior vaccine trial) and receiving non-placebo. For the present study, we included 187 SMM (of a total of 199) who completed the baseline assessment of the longitudinal study and had available data for the measures of interest.

### Measures

At the baseline assessment, participants completed a battery of sociodemographic, identity/stigma, psychosocial, sexual health, and engagement in services measures.

**Demographics.**—Participants reported demographic information including age, race/ethnicity, sexual orientation, education, and income. Each of these were considered as potential factors associated with the main outcome.

#### **Identity and Stigma Factors.**

**Disclosure of Sexual Orientation to Medical Provider.** Participants were asked to report whether they had verbally disclosed their sexual orientation to their health care provider, choosing from five mutually exclusive response options. Participants were coded as “yes” (they had verbally disclosed) if they indicated either of the following responses: (1) *Yes, I volunteered the information without being asked* and (2) *Yes, but only after she or he asked me*. Participants were coded as “no” (they had not verbally disclosed) if they indicated any

of the following: (3) *No, but I would tell if she or he asked*, (4) *No, but I assume she or he knows*, and (5) *No, I would not tell even if she or he asked*.

**Comfort Discussing Sex with Medical Provider.** Participants were asked to report their agreement with the statement “I am very comfortable discussing sex with my health care provider,” on a Likert scale (1 = strongly disagree to 4 = strongly agree).

**Self-Acceptance.** Participants were asked about their degree of self-acceptance on a Likert scale (1 = no acceptance to 10 = complete acceptance).

**Anticipated HIV Stigma.** Participants completed a 16-item measure of anticipated HIV stigma, which assessed the amount of stigma participants anticipated experiencing if they were to acquire HIV. Items were rated on a 4-point Likert scale and summed to create a score from 16 to 64, with higher scores reflecting greater anticipated stigma. Those who completed 14 or more items were retained via mean substitution.

### **Psychosocial Factors.**

**Problematic Alcohol Use.** CAGE (Ewing, 1984) is a 4-item self-report screening measure to identify individuals with problematic alcohol use. Participants indicated whether they had experienced any of four symptoms that reflect a potential alcohol use disorder: cutting down, annoyance by criticism, guilty feelings, and eye-openers (i.e., consuming alcohol in the morning to get going). CAGE is a widely used and valid assessment (Buchsbbaum et al., 1991; Bush et al., 1987; Knowlton et al., 1994; Mayfield et al., 1974). A cut-off score of 2 indicated problematic alcohol use.

**Stimulant Use.** Participants reported whether they had used any of the following stimulants in the past three months: cocaine, crack, methamphetamine, other stimulants.

**Depression.** Participants completed the 9-item Patient Health Questionnaire (PHQ-9; Kroenke et al., 2001) to screen for depression. Participants rated each depressive symptom on a 4-point Likert scale (0 = not at all to 3 = nearly every day). Those who scored 5 or higher on the PHQ-9 screened in for depression.

**Social Anxiety.** Participants completed the 17-item Social Phobia Inventory (SPIN; Connor et al., 2000) which screens for social anxiety through rating core social anxiety symptoms (e.g., avoidance, fear, somatic discomfort) on a 5-point scale (0 = not at all to 4 = extremely). Those who scored a 19 or higher screened in for social anxiety. Individuals who completed at least 15 items were retained with mean substitution.

**Distress Tolerance.** The 4-item Distress Tolerance Scale (adapted from Simons & Gaher, 2005) assessed participants’ experiences of distress and their ability to cope based on their agreement with different statements. Items were rated on an 11-point Likert scale (0 = completely disagree to 10 = strongly agree). Scores reflect the mean for the 4 items, with higher scores indicating lower distress tolerance.

### **Sexual Health Factors.**

**Sexual Compulsivity.** The 10-item Sexual Compulsivity Scale (Kalichman et al., 1994) assessed participants' self-reported ability to control their sexual thoughts and behaviors. Items are rated on a 4-point scale (1 = not at all like me to 4 = very much like me), such that higher scores reflected greater sexual compulsivity.

**Condom Self-Efficacy.** Two items assessed participants' self-efficacy to use condoms in different sexual situations (Wulfert et al., 1996, 1999). Both items were rated on a 7-point Likert scale (1 = very unsure to 7 = very sure), such that higher mean scores indicate greater condom self-efficacy.

**Attribution of Serostatus.** This 14-item scale assesses misattributions of serostatus that MSM may have before engaging in sex. For example, participants rated the degree to which they agreed that they would use thoughts such as "He is younger than me," or "If on his internet profile for HIV status it says 'negative' or 'DDF,'" to determine a sexual partner's HIV status. Items were rated on 5-point Likert scale, with higher scores indicating greater misattributions of serostatus.

**Sexual Behavior.** Sexual behavior was assessed by asking participants to report (1) the number of casual male anal sex partners, (2) the number of anal sex acts, regardless of condom use, and (3) the number of CAS acts with casual male partners they had in the prior three months. We explored each of these as potential factors associated with HIV-prevention engagement.

**Medical Care Relevant HIV-Prevention Engagement.**—Four items that reflected engagement in medical care relevant HIV-prevention behaviors. Participants were asked when they most recently tested for HIV: within the last month, 1–3 months ago, 4–6 months ago, 7–12 months ago, more than a year ago, or never. They were also asked whether they discussed HIV with their healthcare provider, whether they discussed their sexual behavior with their healthcare provider, and if they disclosed when they had CAS to their healthcare provider (all items binary: yes/no). Each of these items were used as indicators of HIV-prevention engagement because all behaviors are relevant in facilitating medical providers' delivery of appropriate HIV-prevention services (e.g., determining relevance of HIV testing). Of note, this data was collected before the widespread implementation of pre-exposure prophylaxis (PrEP), therefore there were not available items reflecting PrEP engagement.

## **Data Analysis**

**Factor Analysis to Develop a Continuous Indicator of Medical Care Relevant HIV-Prevention Engagement.**—We used a factor analytic approach to create a continuous indicator of medical care relevant HIV-prevention engagement using the four available items described above: most recent HIV test, discussed HIV with healthcare provider, discussed sexual behavior with healthcare provider, and discussed "unprotected sex" to healthcare provider. This approach has been used in prior research to create continuous indicators of HIV treatment adherence from a set of binary and Likert scale

items (Harkness et al., 2018; Reynolds et al., 2007; Safren et al., 2014, 2015). Each of these prior studies created reliable, valid measures of adherence, utilizing all available adherence indicators. We accomplished a similar goal in the present study using a factor analytic approach.

To create the continuous HIV-prevention engagement factor scores, we first conducted in IBM SPSS Statistics 26 a maximum likelihood exploratory factor analysis (EFA) with promax rotation using the four items reflecting medical care relevant HIV-prevention engagement. This EFA yielded a one-factor solution, based on examination of the scree plot and one factor having an eigenvalue greater than 1. With the EFA results, we then computed factor scores in Rstudio (R version 3.6.1) using lavaan (lavPredict) with a confirmatory factor analysis model and polychoric correlations which allowed specification of categorical and continuous items. This yielded HIV-prevention engagement factor scores of 1.007 to 2.116 ( $M = 1.72$ ,  $SD = 0.45$ ), with higher scores reflecting greater engagement in HIV-prevention behaviors in a medical setting (i.e., more likely to have tested recently, discuss HIV with provider, discuss sexual behavior with provider, and disclose unprotected sex to provider).

**Factors Associated with HIV-Prevention Engagement.**—Next, we utilized stochastic search variable selection (SSVS) to select variables to use in a multiple linear regression model with HIV-prevention engagement factor scores as the outcome. SSVS is a Bayesian variable selection approach that describes the relative importance of variables (i.e., inclusion probabilities), accounting for uncertainty in other variables that could be used in the model (Bainter et al., 2020; George & McCulloch, 1993). Through sampling thousands of possible regression models, SSVS determines which variables have the highest probability of being included in those models that are best fitting. SSVS then provides marginal inclusion probability scores for each possible variable, which shows the proportion of times that each variable was included in sampled models. Variables with higher inclusion probabilities have more stable associations with the outcome.

As described in Bainter et al. (2020), we used the SSVSforPsych shiny app to conduct SSVS. We used the following SSVS specifications: prior inclusion probability  $\alpha = 0.5$ , 1000 burn-in iterations, and 10000 total iterations. The outcome variable was the HIV-prevention engagement factor score and we included all the potential variables associated with the outcome in the measures section, as well as four sociodemographic variables: age, race/ethnicity, education level, and income. Three variables were identified with markedly higher marginal inclusion probabilities  $>0.3$ : disclosure of sexual orientation to medical provider, comfort discussing sex with medical provider, and education level. Table 2 shows the marginal inclusion probabilities for all variables included in the SSVS analysis.

Finally, those variables selected with inclusion probabilities  $>0.3$  were included in a multiple linear regression model to determine the degree to which each factor was associated with the outcome, HIV-prevention engagement.



## Results

### Demographics and Descriptive Statistics for Key Variables

Participants were 183 SMM who ranged from 19 to 67 years (Table 1). Most identified as non-Hispanic/Latino White, with just over one-third identifying as racial/ethnic minorities. Participants varied in their education and income levels. In terms of sexual behavior, participants reported an average of 6.66 casual male partners in the past three months ( $SD = 8.66$ ), with whom they reported an average of 9.13 anal sex acts ( $SD = 13.7$ ) and 4.43 instances of CAS ( $SD = 10.17$ ). In addition to these demographics, we explored descriptive statistics for each of variable that we included in the multiple linear regression model. Complete participant demographics are reported in Table 1.

We also explored the distribution of key variables included in the multiple linear regression model. Nearly one-third of participants had not verbally disclosed their sexual orientation to their healthcare provider ( $N=56, 30.6\%$ ). One quarter were not comfortable discussing sex with their healthcare provider ( $N=46, 25.1\%$ ). HIV-prevention engagement factor scores ranged from 1.007 to 2.116, with the individual items used to compute the factor scores showing suboptimal HIV-prevention engagement: (1) 28.3% had not tested for HIV in the past six months and 49.1% had not tested in the past three months; (2) 48.6% had not told their provider when they engaged in CAS; (3) 45% had not discussed HIV with their provider; and (4) 35.5% had not discussed their sexual behavior with their provider.

### Multiple Linear Regression Model – Main Outcome

As shown in Table 2, each of the three factors identified through SSVS were significantly associated with HIV-prevention engagement factor scores in the multiple linear regression model. Participants who reported that they had disclosed their sexual orientation to their provider (compared to those who had not;  $B = 0.38, SE = 0.61, p < 0.001, 95\% CI [0.26, 0.50]$ ) and those who were more comfortable discussing sex with their provider ( $B = 0.15, SE = 0.31, p < 0.001, 95\% CI [0.09, 0.22]$ ) had higher HIV-prevention engagement scores. We also found that those with higher levels of education ( $B = 0.10, SE = 0.04, p = 0.007, 95\% CI [0.03, 0.17]$ ) were more engaged in medical care relevant HIV-prevention behaviors. Overall, the model was significant,  $F(3,179) = 35.86, p < 0.001$ , explaining 37.5% of the variance in HIV-prevention engagement scores (adjusted  $R^2 = 0.365$ ).

## Discussion

This study found that SMM were less likely to engage in medical care relevant HIV-prevention behaviors if they have not disclosed their sexual orientation to their healthcare provider, were less comfortable discussing sex with their healthcare provider, and if they had lower levels of education. The findings are particularly notable given that all participants would benefit from engaging based on the study inclusion criteria that all participants must have reported sexual behavior that conferred some degree of risk of acquiring HIV. Furthermore, although participants' sexual behavior varied, Table 2 shows that sexual behavior was not associated with HIV-prevention engagement among this group of SMM. Although prior studies have examined factors associated with SMM's engagement in HIV



testing (e.g., Bernstein et al., 2008; Fisher et al., 2018), which is one type of HIV-prevention behavior, the current study adds to the literature by identifying a set of factors that are associated with SMM's engagement in a constellation of HIV-prevention behaviors that are relevant to medical care settings. As such, the findings from the current study can be used to help inform implementation and dissemination strategies to improve SMM's HIV-prevention engagement in medical settings.

In addition to these primary findings, we found substantial variation in this group of SMM's engagement in HIV-prevention behaviors. Despite all participants being eligible for the larger study based on reporting sexual behaviors that could lead to HIV acquisition, participants reported variable engagement in all HIV-prevention behaviors that we assessed. Nearly half had not tested for HIV in the past three months, did not tell their provider when they had CAS, and did not discuss HIV with their provider. Over a third did not discuss their sexual behavior with their provider. These findings suggest an important gap, whereby those who may benefit the most from HIV-prevention services are insufficiently reached.

We also observed high levels of non-disclosure of sexual orientation (nearly a third of participants) and discomfort discussing sex with a healthcare provider (one quarter of participants). Non-disclosure of sexual orientation was similar in frequency to another study which showed that 39% of sexually active MSM from the New York City HIV Behavioral Surveillance project had not disclosed same sex attraction to their medical provider, with non-disclosure even higher for Black and Latinx MSM (Bernstein et al., 2008). Although these rates of non-disclosure were comparable, we found this rate to be surprising given that the current study took place in a widely known LGBTQ-affirming healthcare facility in the Northeastern US, suggesting this group of individuals is connected to at least one LGBTQ-affirming organization, although they did not necessarily have to be in care at this organization to participate. We would therefore speculate that in other regions of the US or among other groups of SMM who are not connected to LGBTQ-affirming organizations, rates of non-disclosure and discomfort discussing sex with providers could be even higher, with implications for provision or uptake of needed HIV-prevention services (O'Cleirigh et al., Under Review). For example, recent research has shown suboptimal PrEP willingness and use, as well as other sexual health services (e.g., HIV/STI testing, free condoms, individual HIV prevention counseling), among MSM in rural areas of the U.S., compared to MSM residing in urban settings (McKenney et al., 2018; Sullivan et al., 2020). Prior research demonstrated that, in rural settings, LGBTQ individuals who perceive greater provider stigma are less likely to uptake healthcare services, whereas those who were more out in rural settings were more likely to utilize healthcare services (Whitehead et al., 2016). Relatedly, healthcare providers in rural settings report variable LGBTQ-specific knowledge (Shaver et al., 2019), potentially impeding outness to one's provider and access to services. As such, further research is warranted to assess the extent to which the patterns observed in the current study hold in other settings, including rural settings.

The findings from this study should be considered in the context of its limitations. The current study is a secondary analysis of data collected prior to the widespread scale up of PrEP, therefore PrEP was not a focus of the current analysis. Since the parent study was completed, PrEP has been scaled up to MSM throughout the United States, however

it remains underutilized and there are substantial disparities in PrEP use among subgroups of MSM (Centers for Disease Control and Prevention, 2019). Therefore, future research should explore whether the factors associated with medical care relevant HIV-prevention engagement in the present study are also associated with PrEP engagement among SMM. Additionally, although the items used to develop the HIV-prevention engagement factor score were unidimensional in the factor analysis, it is noteworthy that SMM in this study were more likely to have been tested for HIV in the past six months compared to the other prevention behaviors used to create the factor score. This underscores that reality that SMM may receive HIV testing through a provider, but they also may obtain such services elsewhere. Despite this limitation, we did observe that less recent testing did correspond with lower engagement in the other HIV-prevention behaviors, evidenced by the outcome of the factor analysis. Finally, these cross-sectional observations preclude determinations about causal relationships or temporality of the relationships between the factors observed and HIV-prevention engagement. Future longitudinal studies will be able to further explore the temporality of these relationships.

The current findings have implications for practice, particularly as two of the three determinants of lower HIV-prevention engagement observed in the present study are modifiable: disclosure of sexual orientation and comfort discussing sex with a medical provider. Modifying these determinants could involve developing provider education programs to enhance cultural competencies in working with sexual minority men around their sexual health. Such training could also support providers in learning how to initiate discussions about sexual health and HIV rather than requiring MSM to initiate these discussions. Prior research has shown that provider-initiated discussions facilitate MSM feeling comfortable disclosing their sexual orientation and sexual behaviors (Mimiaga et al., 2007). Providers and staff in healthcare settings can also indicate their LGBTQ affirmation in their healthcare settings by using gender neutral language, ensuring that intake forms and healthcare record are LGBTQ inclusive, and having visual signs of inclusiveness and affirmation (Brooks et al., 2018; Halkitis et al., 2020; Mimiaga et al., 2007; Quinn et al., 2015). Patients may choose not to disclose their identity or sexual behavior if providers make heteronormative assumptions or seems to lack knowledge about LGBTQ health (Fisher et al., 2018; Rossman et al., 2017), suggesting the need for healthcare providers to be trained not only initiate conversations about sexual orientation, but also to respond affirmatively when patients disclose a sexual minority identity. Effective LGBTQ-affirming and sex-positive training for medical providers and healthcare settings is important to promote clients' comfort by understanding the specific challenges and needs of the population (Fenway Institute, 2021; Keuroghlian et al., 2017; Sekoni et al., 2017). The *Health Access Initiative* is an example of one such program that could assist clinics and healthcare providers to ensure that the services provided are maximally inclusive of sexual and gender minority patients (Jadwin-Cakmak et al., 2020). Finally, another potential strategy for ensuring that SMM's discomfort discussing sex and non-disclosure of sexual orientation to a provider does not interfere with access to HIV testing could be to ensure universal/routine HIV and STI screening, rather than risk-based screening (Mimiaga et al., 2007; Sanchez et al., 2014; Sullivan et al., 2016).

Although SMM's education levels are perhaps a less immediately modifiable determinant of HIV-engagement outcomes, there are still useful implications for healthcare practice based on this finding. Prior research shows that young SMM with lower levels of education are more likely to report sexual behavior that could lead to HIV acquisition, suggesting the importance of promoting HIV-prevention engagement among SMM with lower education levels (Lim et al., 2012; Strathdee et al., 1998). The current findings echo prior research showing a relationship between education and HIV testing among MSM (Reilly et al., 2014; Wray et al., 2018). Others have shown a relationship between medical literacy and HIV testing among MSM (Mimiaga et al., 2007). To address this barrier, tailored outreach and service delivery efforts may be needed to assist sexual minority men with lower education levels navigating the healthcare system and obtaining needed HIV-prevention services. For instance, patient navigation programs have been shown to overcome education-related barriers to retention in HIV medical care (Bradford et al., 2007; Naar-King et al., 2007).

This study identified factors associated with medical care relevant HIV-prevention engagement among SMM who would benefit from such engagement based on their self-reported sexual behaviors. Men who had not disclosed their sexual orientation to their healthcare provider were less comfortable discussing sex with their healthcare provider, and those who had lower educational attainment were less engaged in HIV-prevention behaviors in a healthcare setting, suggesting actionable strategies for increasing the scale up and dissemination of HIV-prevention services to those who may benefit most.

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**Table 1**

Participant Demographics (N = 183).

<b>Variable</b>	<b>Mean (SD)/Frequency</b>	<b>Range/Percent</b>
Age (years)	36.35 (11.82)	19 – 67
<u>Race/Ethnicity</u>		
Non-Hispanic/Latino White	110	60.1%
Racial/Ethnic Minority*	73	39.9%
<i>Latino/Hispanic</i>	30	16.4%
<i>Black/African American</i>	31	16.9%
<i>Asian</i>	3	1.6%
<i>Multiracial or another race/ethnicity</i>	15	8.2%
<u>Education</u>		
High school diploma or less	39	21.3%
Some college or associates/vocational school	67	36.3%
4-year college degree or more	77	42.1%
<u>Income</u>		
Less than \$10,000	48	26.2%
\$10,000 – \$19,999	36	19.7%
\$20,000 – \$29,999	17	19.7%
\$30,000 – \$39,999	19	10.4%
\$40,000 – \$49,999	15	8.2%
\$50,000 – \$59,999	14	7.7%
\$60,000 – \$69,999	11	6.0%
Greater than \$70,000	23	12.6%

\* Note that participants could endorse more than one racial/ethnic identity, therefore numbers do not add up to 100%.

**Table 2**

Stochastic Search Variable Selection and Multiple Linear Regression Examining Factors Associated with HIV-Prevention Engagement

Variables	SSVS Marginal Inclusion Probability	Multiple Linear Regression Model ( <i>B</i> , <i>SE</i> )
<b>Sexual orientation disclosure</b>	<b>1.00</b>	0.38 (0.61) **
<b>Comfort discussing sex</b>	<b>1.00</b>	0.15 (0.31) **
<b>Education level</b>	<b>0.31</b>	0.10 (0.04) *
Alcohol use	0.05	—
Depression	0.03	—
Stimulant use	0.02	—
Race/ethnicity	0.02	—
Self-acceptance	0.007	—
Condom self-efficacy	0.006	—
Income	0.005	—
Age	0.002	—
Distress tolerance	0.002	—
Anticipated HIV stigma	0.001	—
Anal sex acts (regardless of condom)	0.001	—
Social anxiety	0.001	—
CAS acts	0.001	—
Casual male partners	0.001	—
Sexual compulsivity	0.001	—
Attribution of serostatus	0.001	—

*Note:*

\*  $p < .01$ ,

\*\*  $p < .001$

**Table 3**

## HIV-Prevention Engagement Descriptive Statistics

Variables	Descriptive Statistics	
	M (SD)	Range
HIV-prevention engagement factor score	1.72 (0.45)	1.007 – 2.116
	n	%
Last HIV test		
<i>Past month</i>	37	20.2%
<i>1–3 months ago</i>	56	30.6%
<i>4–6 months ago</i>	38	20.8%
<i>7–12 months ago</i>	18	9.8%
<i>More than a year ago</i>	27	14.7%
<i>Never</i>	7	3.8%
Discussed sexual behavior with provider	118	64.5%
Discussed HIV with provider	119	65.0%
Told provider about CAS	94	51.4%