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# Elevated Perceived Risk for HIV as a Barrier to Accessing Health Care Among Black Men Who Have Sex with Men

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## Abstract

We sought to examine how self-perception of risk for HIV and HIV status information avoidance are related to HIV testing uptake and engagement in routine health care among Black men who have sex with men (BMSM)—the group at highest risk for HIV in the USA. To do so, we used generalized linear modeling and serial mediation modeling to assess data from 342 HIV-negative BMSM collected from 2017 to 2019 in Atlanta, GA, USA. Participants reported considerable concern for testing HIV-positive; 40% reported believing they would test positive for HIV; 27% reported being “extremely concerned about getting HIV”; and 17% reported worrying about HIV “all the time”. Mediation analyses demonstrated that greater concern for HIV was associated with longer intervals since the last HIV test and the last health-care appointment. BMSM perceived themselves to be at considerable risk for HIV, but critically, this outlook did not yield improved health-care behaviors. Findings highlight the need to reconceptualize our public health approach to reaching BMSM. Emphasizing risk behavior and targeting efforts toward BMSM may have unintended consequences and need to be reevaluated. Despite continued efforts to improve HIV-related outcomes, we are failing to meet the needs of BMSM.

**Keywords** HIV testing · Black MSM · Health care

The HIV epidemic among Black men who have sex with men (BMSM) in the USA has continued largely unchanged over the past two decades despite multiple advances in HIV prevention and treatment (CDC 2019a; CDC 2019b). Although BMSM make up a small segment of the population of men who have sex with men (MSM), they disproportionately make up the greatest number of new HIV diagnoses compared with MSM of other races/ethnicities (CDC 2019b). Furthermore, new diagnoses among BMSM have remained stable in recent years, suggesting that interventions to reduce HIV transmission are not reaching BMSM (CDC 2017, 2019a). As a result of the race-/ethnicity-related health disparities in HIV transmission, the Centers for Disease Control and Prevention

(CDC) has consistently called for the need to prioritize HIV prevention and treatment options for specific segments of the US population including BMSM (CDC 2019b).

One area prioritized for HIV prevention is the need to increase HIV testing uptake among BMSM. It is estimated that one-quarter of BMSM who are living with HIV are unaware of their HIV status and that testing according to CDC guidelines (every 3 to 6 months) is not being realized (Mannheimer et al. 2014; Rosenberg et al. 2014). In order to improve HIV testing uptake among BMSM, federal- and state-level efforts have incorporated multiple strategies (e.g., testing campaigns, targeted programmatic efforts) to improve outreach for engaging BMSM. The CDC has supported multiple programs to provide culturally competent messaging for encouraging HIV testing uptake and linkage to care by specifically targeting race/ethnic minority MSM (Herbst et al. 2014). These efforts are warranted and reflect what we understand about the areas of greatest priority when intervening to address the US HIV epidemic.

What is less understood is the potential impact of HIV-related public health messaging on groups who have been disproportionately impacted by HIV. In particular among gay men, who have been heavily targeted in HIV prevention efforts, negative responses to targeted public health

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approaches have emerged (e.g., HIV prevention and safe sex fatigue) (Macapagal et al. 2017; Rowniak 2009; Stolte et al. 2006). Further, debates regarding the advantages of focusing on targeted groups at elevated risk for disease versus focusing on the health and well-being of the general population have existed for decades in the literature (Mays et al. 2004). For example, public health approaches to promoting HIV testing uptake have largely targeted groups based on categorization of risk-taking and racial/ethnic identity (Boudewyns et al. 2018; Campbell et al. 2018; Drumhillier et al. 2018; Murray et al. 2018; Noar et al. 2009; Olawepo et al. 2019). Research in this area, however, has demonstrated that campaigns to increase HIV testing have shown mixed results in regard to increasing HIV testing (Boudewyns et al. 2018; Noar et al. 2009). Likewise, previous work with BMSM specifically has demonstrated that targeted messaging, including HIV messaging content, has been met with skepticism—that even in the context of highly effective HIV treatments, being diagnosed with HIV is viewed as something that would be life changing (Mays et al. 2004; Murray et al. 2018). The gap between public health engagement and meeting the needs of BMSM concerned about testing HIV-positive is potentially vast (Drumhillier et al. 2018) and without further evaluation may lead to continued mixed outcomes when promoting HIV testing uptake.

In order to better understand how BMSM are potentially impacted by HIV prevention efforts, we primarily focused on examining self-perceived risk for HIV (Napper et al. 2012), HIV status information avoidance (Sweeny et al. 2010), and depression (Reisner et al. 2009) as they relate to time since last HIV test and time since last routine health-care appointment. We explored these paths between self-perception of risk for HIV and health-care access behaviors using serial mediation modeling. Prior work in these areas is limited as measures of risk for HIV are typically single-item measures and/or assess the perceived risk of engaging in a particular sex behavior (Napper et al. 2012). In the current study with BMSM, we focused on the extent to which one perceives themselves to be at-risk for contracting HIV, an understudied area of HIV prevention (Epstein 1994). Related, we assessed HIV status information avoidance, which is based on the premise that people will avoid health information that threatens how they think, feel, or behave based on their perceived fear and anxiety (Price et al. 2019; Sweeny et al. 2010). These constructs were used as factors in explaining engagement in health care.

## Methods

Participants were recruited from online social media platforms (e.g., Facebook, Instagram, Snapchat), flyers placed at LGBT venues, and participant referrals. Study activities occurred from March 2017 to March 2019. Participants ( $N = 354$ )

resided in the Atlanta metro area. All participants provided written informed consent, and procedures were approved by an Institutional Review Board. Participants were compensated \$35 for participation in the study. All participants were screened for study eligibility, which included being 18 years of age or older, assigned male sex at birth, identifying as Black/African American, reported having condomless sex with male partners in the past year, reported receipt of an HIV test at least 6 months ago, and reported HIV-negative/unknown status. Study activities included participation in a survey assessment where data were collected through the use of audio computer-assisted self-interview (ACASI). Five participants identified as transwomen, and seven participants identified as heterosexual; due to small sample sizes, these cases were not included in the analyses, and therefore, the analytic sample was  $N = 342$ . Survey administration occurred once as part of the enrollment appointment of a larger, ongoing behavioral intervention trial.

## Measures

### Demographics

Participants were asked for their age, highest level of education, gender identity (male, transgender female, or self-provided identity), sexual orientation (gay/same gender loving, bisexual, heterosexual), employment status (employed/unemployed), income (response set included increments of \$10,000 and was dichotomized to  $<$  or  $\geq$  \$20,000), how their health care is paid for, and if they had been without health care in the past 2 years.

### Health-Care Access and HIV Testing History

Participants were asked to report on the length of time since their last medical exam (“When was the last time you had a physical exam by a doctor or nurse?”,  $< 6$  months ago, 6–12 months ago, 1–2 years ago, 2–5 years ago, and  $> 5$  years ago) and since their last HIV test (“What was the date of your last HIV test?”, categorized as  $< 3$  months ago, 3–6 months ago, 6–12 months ago, 1–2 years ago, 2–3 years ago, and  $> 3$  years ago).

### Depression

Participants completed the Center for Epidemiologic Studies Short Depression Scale (CES-D 10) containing 10 items (Andresen et al. 1994). The scale demonstrated acceptable internal consistency (Cronbach's  $\alpha = .81$ ).

## Self-Perception of HIV Risk

Participants responded to eight items assessing their perception of how likely they are to test positive for HIV (Napper et al. 2012). Example items included, “I worry about getting infected with HIV...” with the response set options including none of the time, rarely, some of the time, a moderate amount of the time, a lot of the time, and all of the time. “I think my chances of getting HIV are...” with the response set options including zero, almost zero, small, moderate, large, and very large. One item was reverse coded, “There is a chance, no matter how small, I could get HIV”, with the response set including strongly disagree to strongly agree. This scale demonstrated acceptable internal consistency (Cronbach’s  $\alpha = .78$ ) (see Table 2 for all items). Overall scores ranged from 0 to 5, with higher scores indicating increased self-perception of HIV risk.

## HIV Status Avoidance

Participants responded to eight questions on the topic of HIV status avoidance, a type of health information avoidance (Price et al. 2019; Sweeny et al. 2010). The response to the items included a 6-point scale from strongly disagree to strongly agree. Items included, in part, “I would rather not know my HIV status” and “When it comes to knowing my HIV status, ignorance is bliss”. The scale demonstrated acceptable internal consistency (Cronbach’s  $\alpha = .75$ ). Overall scores ranged from 1 to 6, with higher scores indicating increased status avoidance.

## Data Analyses

Descriptive statistics were conducted with all variables. Generalized linear modeling using a linear response scale was conducted to identify associations between demographic and psychosocial variables and health-care access variables (time since last routine medical exam and time since last HIV test). We employed a model-based estimator and maximum likelihood estimates for the scale parameters.

For our serial mediation models, we employed PROCESSv3.3 statistical add-on package with 5000 bootstrap samples, and estimates include a 95% CI. Analyses were conducted using IBM SPSS v26. In order to evaluate mediation, two analyses were conducted. Both analyses included self-perception of risk for HIV as the independent variable (IV) and depression and HIV status avoidance as the mediator variables. The first analysis included time since last HIV test as the dependent variable (DV), and the second analysis included time since last routine medical exam as the DV. The IV and DV were selected in order to evaluate whether self-perception of risk for HIV is associated with health-related behaviors. HIV status avoidance was selected in order to establish

whether the IV-DV relationship is impacted by fear of learning one’s HIV status, and depression was selected due to its documented history as a risk factor for HIV among BMSM and its robust impact on HIV-related health-care behaviors (Gonzalez et al. 2011). Age was included as a control variable in the mediation analyses due to its documented association with HIV incidence among BMSM (CDC 2020).

## Results

All included participants ( $N = 342$ ) identified as Black males. Average age was 31.25 ( $SD = 9.96$ ), and the majority of participants had graduated high school (74%). Overall, annual incomes were largely evenly split at above and below \$20,000, and 64% of participants reported having health insurance coverage. Additionally, 42% of participants reported having gone without health-care coverage at some point in the past 2 years. On average, time since last routine medical exam varied, with over half the sample reporting an exam in the past year (67%), 14% 1–2 years ago, 11% 2–5 years ago, and 8% more than 5 years ago. Likewise, 27% of the sample reported a recent HIV test (in the past 3 months), 51% reported a test in the past 3 months to 1 year, and the remaining 20% reported testing more than a year ago. Forty-four percent of participants scored a 10 or higher on the CES-D; scores in this range indicate the need for further mental health evaluation (Andresen et al. 1994). On average, participants did not endorse avoiding information on HIV test results ( $M = 1.48$ ,  $SD = 0.72$ ) (see Table 1).

Participants reported considerable agreement with elevated perception of HIV risk. Forty-eight percent of participants thought that their “chances of getting HIV” were moderate to very large, 81% of sample thought about “getting HIV” “some of the time” or “often”, and 47% felt vulnerable to HIV transmission (see Table 2). Twenty-seven percent reported being “extremely concerned about” getting HIV, and 52% disagreed that they were “unlikely to get infected with HIV”. Forty-two percent reported worrying about “getting infected” with HIV at least a moderate amount of time, which includes 17% of the sample worrying about HIV acquisition “all the time”.

Generalized linear modeling demonstrated multiple relationships with time since last HIV test and time since last routine medical care appointment. Income and HIV status avoidance were significantly associated with time since last HIV test. Further, age, education level, income, depression, and HIV status avoidance were significantly associated with time since last routine health-care appointment (see Table 3).

Mediation analyses demonstrated multiple significant paths in explaining the relationships between self-perception of HIV risk and time since last HIV test. Self-perception of risk was positively associated with depression, depression was

**Table 1** Sociodemographics, psychosocial characteristics, and health-care access among Black gay/bisexual men living in the Atlanta, GA metro area ( $N = 342$ )

	<i>N</i>	%
Age (M, SD)	31.25	9.96
Sexual orientation		
Same gender loving/gay	259	75.7
Bisexual	83	24.3
Education		
≤ High school	90	26.3
> High school	252	73.7
Income		
≤ \$20,000	159	46.5
> \$20,000	183	53.5
Pay for health care		
No coverage	129	37.7
Private insurance	169	49.4
Public insurance	27	7.8
Other	17	4.9
Without health care in past 2 years	146	42.7
Employed	242	70.7
Self-perception of HIV risk (M, SD)	2.87	0.94
Depression (10 or higher)	151	44.2
HIV information avoidance (M, SD)	1.48	0.72
Time since last HIV test		
< 3 months ago	91	26.6
3–6 months ago	62	18.1
6–12 months ago	112	32.7
1–2 years ago	44	12.9
2–3 years ago	8	2.3
> 3 years ago	25	7.3
Time since last medical exam		
< 6 months ago	134	39.2
6–12 months ago	97	28.4
1–2 years ago	47	13.7
2–5 years ago	36	10.5
> 5 years ago	28	8.2

positively associated with HIV status avoidance, and HIV status avoidance was positively associated with time since last HIV test. Further, self-perception of HIV risk was positively associated with HIV status avoidance (see Fig. 1). The direct effect between self-perception of HIV risk and time since last test was not significant; however, multiple indirect paths between these variables were significant; HIV status avoidance mediated the relationship between self-perception of HIV risk and time since last HIV test (indirect = 0.04,  $SE = 0.03$ , 95% CI (0.01, 0.10)); and depression and HIV status avoidance mediated the relationship between self-perception of HIV risk and time since last HIV test (indirect = 0.01,  $SE = 0.01$ , 95%

CI (0.01, 0.02)), indicating serial mediation. Likewise, mediation also demonstrated multiple pathways between self-perception of HIV risk and time since last appointment with health-care provider. Self-perception of HIV risk was positively associated with depression and HIV status avoidance, depression was positively associated with HIV status avoidance and time since last medical appointment, and HIV status avoidance was positively associated with time since last medical appointment (see Fig. 1). The direct path between self-perception of HIV risk and time since last medical exam was not significant; however, multiple indirect paths were significant; depression mediated the relationship between self-perception of HIV risk and time since last medical exam (indirect = 0.03,  $SE = 0.02$ , 95% CI (0.01, 0.08)); HIV status avoidance mediated the relationship between self-perception of HIV risk and time since last medical exam (indirect = 0.03,  $SE = 0.02$ , 95% CI (0.01, 0.07)); and depression and HIV status avoidance mediated the relationship between self-perception of HIV risk and time since last medical exam (indirect = 0.01,  $SE = 0.01$ , 95% CI (0.01, 0.02)), indicating serial mediation.

## Discussion

There are multiple notable findings from the current study that warrant further investigation and extend our current knowledge regarding HIV prevention among BMSM. Findings from the current study shed light on the need to further evaluate our public health approaches to prevention, which have primarily focused on highlighting risk for HIV (Golub 2018; Golub and Myers 2019) with the intention of driving healthy behavioral choices (e.g., uptake of HIV testing). BMSM in the current study perceived themselves to be at considerable risk for HIV, but critically, this outlook did not yield improved health-care behavior. On the contrary, findings suggest that perceiving likely seroconversion is associated with lack of engagement in accessing health care. And, that perceiving elevated risk for HIV may drive depression and HIV status avoidance, which results in reduced likelihood of engagement in HIV testing and routine health-care access.

The lack of direct associations, yet the presence of indirect associations, between self-perceived risk of HIV and health-related behaviors warrants further investigation. The totality of the findings suggests the possibility of an important interplay between cognitions and mental health. Findings from serial mediation analyses highlighted the potential for self-perception of risk to be of greater consequence for individuals reporting higher levels of depressive symptoms and HIV status avoidance. Addressing mental health (e.g., depression) and HIV status avoidance may be indirect avenues to encouraging health-care access and appear to be more relevant than focusing on self-perceived risk alone. These findings are an extension of the literature as a

**Table 2** Study measures and response options for measures regarding the concern for HIV seroconversion among Black gay/bisexual men living in the Atlanta, GA metro area

	None of the time (n/%)	Rarely	Some of the time	A moderate amount of the time	A lot of the time	All of the time
1. I worry about getting infected with HIV	38 (11.0)	53 (15.3)	110 (31.7)	54 (15.6)	33 (9.5)	59 (17.0)
	Strongly disagree	Somewhat disagree	Slightly disagree	Slightly agree	Somewhat agree	Strongly agree
2. I feel I am unlikely to get infected with HIV	107 (31.3)	26 (7.6)	47 (13.7)	37 (10.8)	52 (15.2)	72 (21.1)
3. I feel vulnerable to HIV infection	131 (38.3)	34 (9.9)	39 (11.4)	47 (13.7)	38 (11.1)	53 (15.5)
4. There is a chance, no matter how small, I could get HIV	31 (9.1)	11 (32.)	9 (2.6)	51 (14.9)	51 (14.9)	189 (55.3)
	Not concerned about	A little concerned about	Moderately concerned about	Concerned about a lot	Extremely concerned about	
5. Getting HIV is something I am	35 (10.1)	41 (11.8)	118 (34.0)	58 (16.7)	95 (27.4)	
	Zero	Almost zero	Small	Moderate	Large	Very Large
6. I think my chances of getting HIV are	36 (10.4)	47 (13.5)	97 (28.0)	111 (32.0)	26 (7.5)	29 (8.4)
	Never thought about	Rarely thought about	Thought about some of the time	Thought about often		
7. Getting HIV is something I have	16 (4.6)	52 (15.0)	137 (39.5)	142 (40.9)		
	Extremely unlikely	Very unlikely	Somewhat unlikely	Somewhat likely	Very likely	Extremely likely
8. What is your gut feeling about how likely you are to get infected with HIV?	46 (13.3)	62 (17.9)	114 (32.9)	90 (25.9)	21 (6.1)	14 (4.0)

recent meta-analysis noted the need to evaluate emotional states, such as depression, when assessing the link between cognitive factors and HIV testing (Evangeli et al. 2016). The current paper brings to light the complicated nature of and importance of studying these relationships. As noted in the limitations, however, data are cross-sectional, and therefore, mediation analyses are limited in their interpretation.

Although prior literature has found elevated prevalence of depressive symptoms among BMSM (Williams et al. 2015), we present this finding in a novel manner through the use of a

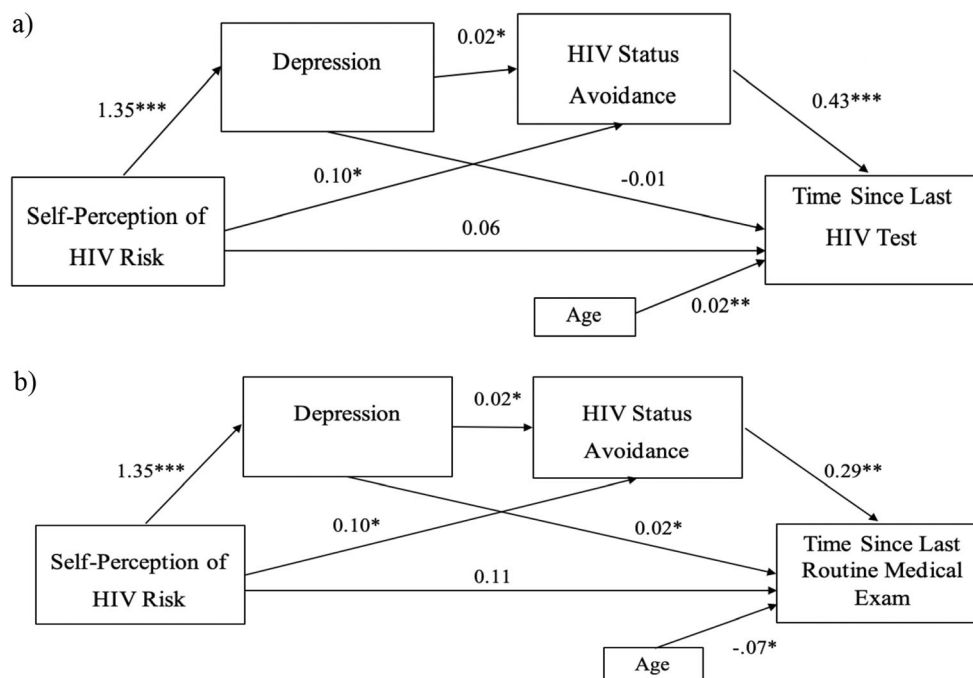
serial mediation model. Based on the depression-related findings, it is important to consider the broader impact of public health messaging on mental health. The strong targeting of BMSM in HIV-related public health messaging has potentially led to the unintended consequence of overwhelming individuals with concern regarding HIV seroconversion, yielding poorer mental health outcomes (i.e., depressive symptoms), increased status avoidance, and negatively impacting linkage to HIV testing and routine health care. Moreover, there exists a dearth of literature focusing on the relationship between

**Table 3** Linear regression analyses to identify bivariate relationships with time since last HIV test and time since last routine medical exam, among Black gay/bisexual men living in the Atlanta, GA, metro area (N = 342).

	Time since last HIV test	Time since last routine medical exam
Age (M, SD)	0.02 (0.01)	-0.01 (0.01)*
Sexual orientation		
Same gender loving/gay (ref)		
Bisexual	0.26 (0.18)	-0.28 (0.16)
Education	-0.10 (0.07)	-0.15 (0.06)*
Income	-0.09 (0.04)*	-0.12 (0.04)**
Without health care in past 2 years	0.15 (0.16)	0.14 (0.14)
Employed	-0.31 (0.16)	-0.05 (0.14)
Self-perception of HIV risk	0.07 (0.08)	0.11 (.07)
Depression	-0.01 (0.01)	0.03 (0.01)**
HIV status avoidance	0.41 (0.11)***	0.34 (0.10)***

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

**Fig. 1** Serial mediation model of self-perception of HIV risk predicting (a) time since last HIV test and (b) time since last medical appointment with health-care provider, among Black gay/bisexual men living in the Atlanta, GA, metro area



mental health and perception of risk for disease (Rovner et al. 2014). Limited prior work, however, acknowledges that prior models of health behavior change (Janz and Becker 1984; Rovner et al. 2014) (e.g., health belief model, transtheoretical model) do not include paths representing mental health. Given what is understood about depression—that depression can impact motivation and self-efficacy regarding one’s health care (Egede et al. 2009)—paths representing mental health in these models are likely critical for a more robust representation of factors impacting health-care access.

The varied paths noted between the direct and indirect effects potentially have implications for intervention development and public health messaging (Kingdon et al. 2013). Emphasizing risk is not having the desired results and novel strategies are needed. Emerging approaches, such as emphasizing an HIV status neutral approach to HIV health care (Myers et al. 2018), or personalized messaging for engaging individuals in testing (Ingersoll et al. 2014), are gaining ground and may circumvent the negative impact of relying on heightening awareness of perception of risk for prevention. Related, findings from the current study extend work conducted by Golub (2018) which underscores the consequences of targeting “high-risk” populations in HIV prevention. Outreach to individuals most impacted by HIV has led to stereotyping these individuals as engaging in “unacceptable” behaviors which creates an environment of shame (MacKellar et al. 2007).

The relatively high endorsement of risk for HIV brings attention to research conducted on a related concept, that of HIV fatalism, or the belief that regardless of one’s actual behaviors, seroconversion is inevitable (Yi et al. 2010).

Most work in HIV fatalism, however, has been conducted in countries with reduced access to antiretroviral treatment (ARV) (Hess and McKinney 2007; Sileo et al. 2019) or occurred early in the HIV epidemic before the availability of ARV (Kalichman et al. 1997). Researching HIV fatalism under these circumstances is reasonable and warranted. In the current sample, the elevated endorsement of distress regarding the inevitability of seroconversion and preoccupation with worry regarding HIV transmission is very concerning given the advances that have been made in HIV treatment and prevention. The fact that individuals hold these perceptions and beliefs at a time when multiple ARV-based advances (i.e., undetectable = untransmittable (Cohen et al. 2016) and PrEP (Grant et al. 2010) have been made in HIV prevention speaks strongly to our failed efforts to effectively engage BMSM.

Results also suggest the need for a broader acknowledgement of the limited utility of relying on risk perception as a motivator for accessing HIV prevention tools. In particular, in the context of accessing PrEP for HIV prevention, it is known that establishing level of risk for HIV as a step to determine PrEP candidacy is problematic (Biello et al. 2019). Much of this research has focused on the limitation of only assessing behavior (e.g., condomless anal sex) rather than the broader context of the behavior (e.g., viral load of partners in one’s sexual network) to establish risk (Golub 2014). Our findings call attention to the limitations of focusing on risk by demonstrating that perceiving risk confers avoidant HIV testing behavior, the exact opposite response of the intended focus.



## Limitations

The current study should be interpreted in light of the limitations it presents. Data were collected using cross-sectional methodology, which may impact results in mediation analyses. Study analyses are exploratory in nature, and therefore, causality cannot be confirmed. Findings also rely on self-report of potentially stigmatizing information. By virtue of participation in the larger behavioral intervention trial, participants may differ from individuals who would not participate in a behavioral trial. Therefore, findings may not be generalizable to individuals unwilling or unable to participate. The extent to which risk perceptions vary across participants willing and unwilling to enroll in a trial is unknown but is potentially an important limitation. Study findings are also limited to BMSM in the southern USA and therefore should not be extended to MSM outside of this region.

## Conclusions

Overall, results suggest the strong need to reconceptualize how we are engaging BMSM in public health domains. Continuing to focus on HIV as an outcome of risk-taking behavior and relying on this model to encourage HIV testing uptake will only yield limited results for improving the HIV care continuum. Extant scholarship (Bowleg et al. 2017; Duncan et al. 2019) in HIV prevention intervention research focuses on the need to incorporate the health equity framework as an approach that “ensures that Black MSM are not explicitly or implicitly deemed as deviant, disordered, or the non-reference group” (Duncan et al. 2019). This framework may serve as a valuable approach to addressing unintended consequences of targeting populations for HIV prevention services. With this approach, the point of interaction between an individual and their environment is the primary focus. An improved understanding of this perspective would likely result in important changes in how we deliver HIV prevention and treatment services. Overall, findings from the current study highlight the need to rethink our public health approach to increasing HIV testing among individuals at elevated risk for HIV. Despite continued and targeted efforts to improve the HIV care continuum among BMSM, we are failing to meet the needs of BMSM, and year after year HIV transmission rates remain largely unchanged (CDC 2019b). Substantial changes to our public health approach are warranted.

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## Compliance with Ethical Standards

**Conflict of Interest** The authors declare that they have no conflict of interest.

**Ethical Approval** This research involved human subjects and was conducted with the approval of the University of Connecticut Institutional Review Board, and research was conducted in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

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