

# The Association Between Alcohol Consumption and Condom Use: Considering Correlates of HIV Risk Among Black Men Who Have Sex with Men

Vincent C. Allen Jr.<sup>1</sup> · Hector F. Myers<sup>2</sup> · Lara Ray<sup>1</sup>

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**Abstract** Epidemiological data indicate Black men who have sex with men (MSM) are the most at-risk group for HIV infection. However, the factors driving this disparity are not fully understood. Condom use remains a significant point of intervention in mitigating sexually transmitted infections. Alcohol consumption is highly prevalent among Black MSM, has a significant role in the culture of sex, and may significantly interfere with condom use. This review will examine the relationship between alcohol consumption and condom use among Black MSM. In this review we, (a) discuss the prevalence of alcohol use among MSM and its association with condom use; (b) consider the role of alcohol in the culture of MSM; (c) review the literature on the relationship between alcohol and condom use; and (d) discuss the role of several empirically-supported moderating variables in strengthening the relationship between alcohol use and noncondom use. This review places the finding and implications for HIV risk among Black MSM in the context of the broader literature on MSM.

**Keywords** Black MSM · HIV · Alcohol · Condom use

## Introduction

In the United States, men who have sex with men (MSM) have been the group most affected by HIV/AIDS morbidity and mortality. According to the Centers for Disease Control and Prevention (CDC), MSM accounted for more than half of new HIV infections between 2008 and 2010, despite comprising approximately 2 % of the US population [1]. Among MSM, Black MSM are disproportionately affected accounting for 39 % of new infections among MSM, followed by White (34 %) and Hispanic/Latino (23 %) MSM [2, 3]. A model based on annual HIV incidence predicted that Black MSM have a 25 % chance of being HIV-positive by age 25, and a 60 % chance of contracting the virus by age 40 [4]. Despite the overall stability of HIV incidence among MSM, high HIV prevalence among Black MSM persists and nearly one out of every three (28 %) Black MSM are living with HIV [5]. Black MSM are considered the most at-risk group for HIV infection [6], and nationally there are increased efforts to better characterize the correlates of HIV risk that are driving the epidemic among Black MSM. Numerous factors interact to influence sexual behavior among Black MSM. As a result, the identification of correlates of HIV risk behaviors is multifaceted and complex [7].

Substance use has been identified as a risk factor for HIV and is highly prevalent among MSM [8]. MSM use substances at a greater rate than the general population and have higher rates of substance abuse [9–11]. Among MSM, the use of illicit drugs such as methamphetamine, cocaine, and injection drugs is associated with non-condom use during anal intercourse [12]. In addition to illicit drug use, alcohol consumption is prevalent among MSM. Alcohol use impairs judgment during sexual intercourse, potentially decreasing the likelihood of condom use [13]. The

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✉ Vincent C. Allen Jr.  
vcallenjr@gmail.com; vallen@psych.ucla.edu

<sup>1</sup> Psychology Department, University of California, Los Angeles, 1285 Franz Hall, Box 951563, Los Angeles, CA 90095-1563, USA

<sup>2</sup> Medicine, Health, and Society Psychology, Vanderbilt University, Nashville, TN, USA

impaired judgment characteristic of alcohol use is not unique to MSM. However, given the increased HIV prevalence among MSM, particularly Black MSM, alcohol-induced lapses in judgment regarding condom use can put Black MSM at a greater likelihood of contracting HIV.

This is especially important given that, compared to their White counterparts, Black MSM are more than twice as likely to encounter a sexual partner living with HIV [14]. To have a 50 % change of acquiring HIV Black MSM need to have 3 sexual partners compared to 7 partners for White MSM. To have a 90 % chance of HIV infection Black MSM need 10 sexual partners compared to 25 for White MSM [14]. Furthermore, Black MSM living with HIV are less likely to be engaged in medical care and receive antiretroviral treatment that could result in viral suppression and decrease the likelihood of HIV transmission [15]. Despite no significant differences in the prevalence of risky sexual behavior between Black MSM and MSM of other races [15], there is elevated HIV risk for Black MSM when engaging in risky sex. Therefore, the potential consequences of alcohol use in the context of sexual behavior are greater for Black MSM than for MSM of other racial groups.

In light of the alarming epidemiological data on HIV among Black MSM and the need to rapidly enhance prevention strategies, this review will, (a) discuss the prevalence of alcohol use among MSM and its association with condom use; (b) consider the role of alcohol in the culture of MSM; (c) critically examine the literature on the relationship between alcohol and condom use; and (d) discuss the role of several empirically-supported moderating variables in strengthening the relationship between alcohol use and non-condom use. Since the literature varies in the ways in which sexual minority men are described, we attempt to distinguish the research that has been conducted with MSM versus gay and bisexual men. Additionally, we discuss the MSM literature broadly while emphasizing the work done with Black MSM and the implications for this population.

### Alcohol Use Among MSM

Alcohol use is highly prevalent among MSM, particularly urban men [16–21]. Studies report levels of recreational alcohol use as high as 85 % among MSM, with between 8 and 19 % reporting heavy or frequent use [9, 18, 22–28]. Although MSM are more likely than the general population to use illicit drugs [9, 10], studies are inconsistent in regard to the comparative use of alcohol. The CDC [8] indicates that gay and bisexual men are more likely to use alcohol and continue heavy drinking later in life. However, other studies suggest MSM use alcohol at rates comparable to their heterosexual counterparts, but in treatment situations

are less likely to abstain from drinking or to view alcohol abstinence as a treatment goal [16, 29].

### Alcohol Use Among Black MSM

Epidemiological data suggest that Black adults generally use and abuse alcohol at lower rates than the general population. The National Survey on Drug Use and Health examined national rates of substance use. Nearly half (43.2 %) of Black adults reported past month alcohol use and 20.6 % reported past month binge drinking, compared to the national average of 57.4 and 23.9 %, respectively [30]. Similar trends were demonstrated among Black men specifically, such that when compared to men nationally Black men had lower rates of past month alcohol use (54 vs. 62.3 %) and binge alcohol use (30.8 vs. 33.8 %) [31]. While large epidemiological studies indicate that Black men report lower levels of alcohol use than the national average, high rates of alcohol use are still seen among Black men, particularly in smaller cross-sectional studies, and alcohol use is significantly associated between alcohol use and risk for HIV and sexual transmitted infections (STIs) [32–35].

There is a dearth of literature comparing the alcohol use rates of Black MSM to that of their heterosexual counterparts. Therefore, it is unclear the extent to which the alcohol use behaviors of Black MSM differ from that of Black heterosexual men or Black adults in general. Nevertheless, studies of Black MSM indicate high rates of alcohol use, and findings across studies intimate that this is largely consistent with the substance use behaviors of MSM communities broadly [9]. Examining rates of problematic alcohol use, defined as endorsing three or more alcohol-related problems, Stall et al. [9] found rates as high as 13 % among urban Black MSM. Similarly, Reisner et al. [19] used the CAGE Questionnaire [36] to assess alcohol dependence among 197 Black MSM in Massachusetts, and discovered that nearly one-third (29 %) reported problematic alcohol use. A cross-sectional study of 142 urban Black MSM also found that nearly half (43 %) reported hazardous or high risk levels of alcohol use, as assessed by the Alcohol Use Disorders Identification Test [37].

Although alcohol use is common among MSM, MSM are not at higher risk of developing alcohol use-disorders than men in the general population [16]. Therefore, high rates of alcohol use may reflect a larger culture of substance use among men [9]. Base rates alone suggest that MSM are most distinguished from their heterosexual counterparts by their illicit drug use, and not their alcohol use patterns [9, 10]. However, alcohol used in the context of sex can increase the HIV risk of MSM who experience a greater burden of HIV. Although MSM may not experience

a disparity in alcohol use per se, they may be disparately affected by the deleterious results of such use. This is particularly true for Black MSM. Despite lower rates of alcohol use among Black adults in general, Blacks have an increased likelihood of experiencing the consequences of alcohol use, including the physical as well as social (e.g. incarceration) consequences [38]. For Black MSM, the potential for HIV risk behavior resulting from alcohol use during sex may be conceptualized as one such consequence. HIV prevention efforts aimed at Black MSM require a comprehensive understanding of alcohol use patterns and the role such use plays in sexual behavior, especially decisions around condom use.

### Alcohol Consumption and Condom Use

Although there is support for the role of alcohol use in decreasing the likelihood of condom use during sex, studies of this relationship yield inconsistent results. Leigh [39] conducted a meta-analysis of non-MSM specific studies examining the relationship between alcohol use and condom use in event-level studies. Event-level studies assess substance use and sexual behavior surrounding a specific sexual encounter, such as the most recent encounter [12]. Event-level assessments may be advantageous in that they strengthen casual inferences by asking about drinking and condom use that occur on the same occasion [39]. Such assessments also capture important contextual details (e.g. substance use, sex position, partner and environmental characteristics) that may be beyond the scope of other assessment methodologies [12]. The meta-analysis of non-MSM specific studies conducted by Leigh [39] found that drinking was unrelated to condom use at the event-level, even in recent encounters with new partners.

Vosburgh et al. [12] reviewed the literature on the event-level association between substance use and sexual behavior among MSM. Of the 11 specific substances measured across the 23 studies, only methamphetamine use and binge drinking were consistently associated with sexual risk behavior. Ten of the 23 studies assessed alcohol use that was not binge drinking. Of these 10 studies, six found no association with sexual risk behavior and three studies found only a bivariate association. Only one study demonstrated a significant multivariate association in which alcohol use before sex was actually protective when controlling for drug use before sex.

Results of the association between alcohol and risky sexual behavior are inconsistent and research in this area does not definitively support the hypothesis that there is a direct influence of alcohol on sexual risk behavior [39, 40]. Nevertheless, event-level studies of MSM demonstrate that binge drinking is associated with non-condom use during

sex although general alcohol use is not [12]. Therefore, at the event-level it may not be alcohol consumption in general, but the level of alcohol use that increases sexual risk-taking among MSM [12].

Although meta-analyses of studies with MSM and non-MSM specific studies fail to definitely support a direct influence of alcohol on sexual behavior, several studies of MSM do demonstrate an association between alcohol consumption and condom use. In an online survey of 2916 mixed HIV-serostatus gay and bisexual men, alcohol and recreational drug use were associated with non-condom use during anal sex [41]. Colfax et al. [24] examined 4295 HIV-negative MSM and found that binge drinking (i.e. 6 or more alcoholic drinks) before or during sex predicted non-condom use during serodiscordant anal sex. Among HIV-negative MSM with diagnosed alcohol dependence, drinking has been associated with decreased condom use, particularly during receptive anal sex [26]. Additionally, drinking before sex has been associated with HIV-positive MSM engaging in anal sex without condoms and with unknown serostatus partners [42]. Similar results were reported among samples of Black MSM. Wilton [43] found that alcohol use before or during sex was predictive of several HIV risk behaviors in a sample of 481 mixed HIV serostatus Black gay and bisexual men. In the study of alcohol problems by Reisner et al. [19], Black MSM who reported at least one episode of non-condom use during sex with a serodiscordant casual male partner during their last sexual encounter were three times as likely to have a drinking problem.

Although, the sexual behavior literature broadly is inconsistent in its support for a significant association between alcohol consumption and condom use, several studies of MSM report a significant relationship. Such inconsistencies may be the result of varied methodological approaches; such that the association may be strongest at the global level (i.e. measuring substance use and sexual behavior over a broad period of time), and not as strong at the event level. This inconsistency in findings suggests the need for more thorough exploration of the effect of alcohol on sexual behavior across multiple levels of analyses and among Black MSM specifically.

## The Relationship Between Alcohol and Sex Among MSM

### Alcohol and MSM Cultures

Alcohol use may serve a unique function in the lives of MSM. Alcohol use among gay and bisexual men can be a reaction to social marginalization (e.g. homophobia, discrimination, violence) resulting from their sexual

orientation and may be associated with other mental health issues such as depression, anxiety, and substance use disorders [8]. Historically, gay bars and clubs have played an important role in providing a safe space for gay and bisexual men [44, 45]. As a result, it has been argued that bar attendance, and the accompanying alcohol consumption, have been integral in men participating in gay communities and culture [12]. Stall et al. [9] examined alcohol use among urban MSM and found that affiliation with gay male culture was predictive of frequent heavy alcohol use, alcohol-related problems, frequent drug use, and multiple drug use. These associations suggest that while integration into gay culture provides affirmation and acceptance, aspects of the culture may also be risk inducing for MSM by encouraging substance use. Additionally, Stall et al. [9] argued that an understanding of heavy substance use among MSM requires an understanding of MSM sexual cultures. This is relevant given that alcohol use often facilitates sexual encounters among MSM, and places in which MSM are likely to find sexual partners (e.g. bars, circuit parties) are also places characterized by substance use [46]. The role of substance use, and alcohol in particular, in facilitating sex is of concern among communities, such as Black MSM, characterized by high rates of substance use, substance use in the context of sex, and HIV incidence.

The consumption of alcohol during sex by MSM, particularly among non-gay identified MSM, may reflect a need to excuse engagement in sexual behavior that is socially unacceptable yet personally desirable [38, 46, 47]. The Cognitive Escape model contends that among MSM substance use has a significant role in decreasing cognitive dissonance related to engagement in homosexual sex, and provides an “escape” from the awareness of HIV risk [46, 48]. Qualitative studies of men who have sex with men and women have found that for men expressing discomfort around their sexuality, alcohol enabled them to engage in a variety of sexual acts with male partners [49]. Such men also reported drinking alcohol while participating in gay-related social (e.g. nightclubs) and sexual activities in an attempt to decrease their discomfort and to “be themselves” [49].

Harawa et al. [38] conducted a qualitative study exploring the ways in which non-gay identified Black MSM understood the role of drugs and alcohol in sex with men. Four domains were identified that described the role of substance use in sexual encounters: substances as (1) *motivators*; (2) *allowers*; (3) *rationalizers*; and (4) *facilitators*. Substances as *motivators* described instances in which men used sex to gain access to desired goods, such as through exchange sex encounters in which men performed sexual acts in order to access drugs, alcohol, money or other material goods. Substances as *allowers* explained the ways

in which intoxication allowed men to act on desires for sex with men despite a personal intention to avoid homosexual behavior. The subtheme of substances as *rationalizers* described situations in which men retrospectively excused their homosexual behavior because it resulted from intoxication. Finally, substances as *facilitators* described the ways in which substance use eased access to potential sexual partners. Men described substance use as leading to or encouraging sex, particularly among substance using communities and in the sexually charged environments in which substances use often occurs [38].

While alcohol may be used to deal with men’s discomfort regarding their sexual desires, there are men for whom alcohol is intentionally used to enhance their sexual experiences and to gain a sense of power during the sexual experience [49]. A study of substance use among HIV-positive MSM found that nearly all (90 %) of the men used drugs to enhance sexual pleasure, and that drug use dulled negative feelings about living with HIV [50]. Although these findings deal with drug use, they likely generalize to substance use broadly and suggest that motivations for alcohol use during sex are multi-faceted. For MSM, alcohol use during sex may be related to personal sexual enjoyment or a response to societal disapproval of homosexual behavior and stigma associated with HIV. Examining the relationship between alcohol and sexual behavior among MSM allows for a more nuanced understanding of the ways in which, and reasons why, alcohol may be related to condom use in this group.

### Factors Influencing the Relationship Between Alcohol and Risky Sex

Black MSM are not monolithic, nor are their intentions for consuming alcohol. Numerous factors can explain the role of alcohol in the lives of Black MSM as well as the reasons for which they engage in alcohol use during sexual activity. Understanding these dynamics can help to better characterize Black MSM’s motivation for alcohol use and its role in risky sex. The following section discusses a few variables that have been found to significantly influence the relationship between alcohol and condom use, and that may explain or affect the strength of this association.

#### Alcohol Expectancies

In qualitative studies examining reasons for alcohol use, MSM have reported using alcohol to facilitate sexual experiences and increase sexual performance [49]. Although changes in sexual behavior and desire are often attributed to alcohol consumption [51], it is likely that alcohol’s perceived influence on sexual behaviors is primarily a

result of socially learned expectancies around the anticipated effects of alcohol. Alcohol expectancy theory asserts that behavior during periods of intoxication is guided by prior expectations of the effects of alcohol on behavior [52]. This may be especially true for individuals holding strong sex-related alcohol expectancies, believing that alcohol consumption will increase sexual desire and facilitate sexual behavior. To that end, the association between alcohol and sexual behavior may be moderated by sex-related alcohol expectancies, such that a particular subgroup of individuals with strong sex-related alcohol expectancies increase their sexual risk behavior when drinking [40].

Among MSM, sex-related alcohol expectancies are found to significantly predict subsequent alcohol use and sexual behavior. An experimental study of 117 predominately White MSM, 21–50 years old, found a direct effect of sex-related alcohol expectancies on risk perception. Participants reporting higher alcohol expectancies were more likely to endorse the positive consequences of being with a new partner, thereby endorsing lower risk perceptions [53]. Similarly, cross-sectional studies of gay and bisexual men have found sex-related substance use expectancies to be significantly associated with non-condom use [54], and substance use before sex [55]. Kalichman et al. [55] concluded that altering substance use expectancies may be an important HIV prevention strategy for sensation seeking MSM.

The role of substance expectancies have been demonstrated among MSM, yet little has been done to examine sex-related alcohol expectancies among Black MSM specifically. Given differences in rates of alcohol use between Black men and men of other races [31], as well as sociocultural differences in the role of alcohol [56], studies of sex-related alcohol expectancies among samples of predominately White MSM may not generalize to Black MSM. Therefore, research in this area is needed to assess whether sex-related alcohol expectancies moderate the relationship between alcohol and condom use among Black MSM.

### Personality Traits

In addition to finding support for the role of sex-related substance use expectancies in risky sexual behavior among MSM, Kalichman et al. [55] found that sensation seeking accounted for variance in risky sexual behavior over and above substance use before sex. Results suggested that sensation seeking predicted substance use expectancies, and this, in turn, predicted substance use before sex. These and other findings suggest that the association between substance use and risky sex may be less reflective of a direct relationship, and more indicative of underlying

personality traits. Risk-related traits such as sensation seeking and impulsivity are individually associated with alcohol use and non-condom use. Therefore, such traits may moderate the association between the two variables [40].

Sensation seeking among MSM is associated with non-condom use [57–59], number of casual sexual partners, non-condom use with casual sexual partners, and history of STIs [60]. Newcomb et al. [58] conducted a longitudinal study of sensation seeking and its effect on sexual risk among 114 young (16–20 years old) MSM. Sensation seeking moderated the relationship between alcohol and drug use prior to sex and condom use. Specifically, the association between frequency of condom use and substance use prior to sex was strongest among participants with higher levels of sensation seeking.

Among MSM, impulsivity, a related yet distinct construct from sensation-seeking, is associated with polysubstance use [61], anonymous sex [62], and non-condom use [63, 64]. Semple et al. [63] investigated the role of impulsivity in the relationship between methamphetamine use and sexual behavior. Impulsivity was defined as the tendency to act without thinking and without concern for negative consequences, and was measured using a 12-item self-report impulsivity scale developed by Dickman [65]. Examining a sample of methamphetamine-using HIV-positive MSM, a model including high levels of impulsivity predicted more non-condom use. In addition, impulsivity significantly moderated the relationship such that the relationship between methamphetamine use and non-condom use was strongest among men with higher levels of impulsivity [63].

Impulsivity and sensation seeking among MSM act to put men at risk for engaging in substance use during sex as well as sexual risk behavior. The effect of sensation seeking and impulsivity on sexual risk behavior among MSM is of particular concern among young MSM. Impulsivity and risk-taking are increased during adolescence [66]. Therefore, young MSM present a particularly vulnerable group to the effects of such personality traits on risky sexual behavior. It is important to note that the high rates of HIV among Black MSM are largely driven by high HIV incidence among young Black MSM ages 13–24 [1]. Therefore, it is not only important to understand the role of these personality traits as they relate to the substance use and sexual risk behavior of Black MSM, but an investigation into the role of these personality traits in increasing risk for non-condom use among young Black MSM is warranted. Such investigation may better elucidate a pathway to HIV risk for young Black MSM, and the role of alcohol use, impulsivity, and sensation seeking in such a pathway.

## Bisexual Behavior

Sex with women is prevalent among MSM [67], and Black MSM are more likely than MSM of other racial/ethnic groups to identify as bisexual and be behaviorally bisexual [68]. The National Behavioral Surveillance Survey found that 14 % of Black, 8 % of Hispanic, and 4.2 % of White MSM reported sex with women in the prior 12 months [69]. This is particularly high given that an estimated 1 % of men in the general population ages 15–44 reported engaging in bisexual behavior over the past year [70]. A review by Millett et al. [68] examined 18 studies of Black MSM and found that 2–71 % of men reported bisexual behavior, with 11–40 % self-identifying as bisexual. Studies of Black men who have sex with men and women (MSMW) specifically tend to find that such men largely identify as bisexual [38, 71], consistent with MSMW broadly who are more likely than men who have sex with men only (MSMO) to identify as bisexual [67].

In research contexts, behaviorally bisexual and homosexual men are often combined into a single category (i.e. MSM) [72]. However, distinctions between MSMO and MSMW are important given that the two subgroups are different. Demographically, MSMW are older [67, 72] and more likely to be Black [67]. Some important economic differences are noted, such that MSMW have lower annual incomes [67, 73, 74] and are more likely to report current unemployment and homelessness [67, 73, 74]. MSMW are also less educated [67, 73] and more likely to report a lifetime history of incarceration [67, 74]. Sexual identity also distinguishes MSMW and MSMO, with MSMW being less likely to identify as homosexual, largely identifying as bisexual [67].

Substance use also distinguishes the two groups, with MSMW being more likely: (1) to report injection drug use [75–77]; (2) to have used stimulants in the past 30 days [74]; (3) to report trading sex for money or drugs [77]; (4) to have sex under the influence of substances [77]. MSMW also demonstrate lower intentions to use condoms [78], and weaker peer norms favoring risk avoidance and safe sex [78].

Similar differences are demonstrated among Black MSM, such that Black MSMW have elevated levels of interconnected factors including higher internalized homophobia, lower social support, and higher depression than Black MSMO [79]. Furthermore, compared to Black MSMO, Black MSMW have been found to be: (1) older; (2) less educated; (3) more likely to have lower incomes; (4) more unemployed; (5) less stably housed; and (6) more likely to have been incarcerated [79]. These psychosocial differences suggest that Black MSMW may face differentially greater psychosocial burden [79]. These distinctions are important given that economic disenfranchisement may

drive men to engage in risky behaviors as a means to access money, drugs, or material goods [79]. Additionally, factors such as homelessness, unemployment, and incarceration are related to HIV risk among Black MSM [15], as are psychological factors such as depression, social support and internalized homophobia [80, 81]. Therefore, understanding psychosocial distinctions between Black MSMO and MSMW can assist in identifying men who are most vulnerable and addressing the most pertinent correlates of HIV risk for each subgroup.

Compared to MSMO, MSMW may be at increased risk for substance use [74–77], sex under the influence of substances [77], and endorsing peer norms that fail to discourage risky sexual behaviors [78]. Bisexually-identified Black MSM report significantly higher levels of alcohol use and abuse than gay-identified Black MSM [82, 83]. As a result, bisexual activity and behavior-incongruent sexual identification may interact to place MSM, particularly non-gay identified MSMW, at increased likelihood for alcohol consumption during sexual activity. Operario et al. [84] conducted a study of urban non-gay identified Black MSMW and found that 90 % of men reported some substance use before having sex in the past 30 days. Alcohol was the substance most frequently used prior to sex by 71 % of the men studied [84]. Similarly, Wohl et al. [85] examined 70 heterosexually identified urban Black MSM and found that the majority (64 %) reported being under the influence of drugs or alcohol during all episodes of anal sex with male partners [85]. Therefore, Black MSMW and non-gay identified Black MSM may represent subgroups of MSM at increased risk given their high rates of alcohol use, substance use in the context of sex, and sociocultural factors that may motivate alcohol use among such men.

Taken together, it is plausible that the relationship between alcohol and condom use may be stronger for Black MSMW than Black MSMO. This is consistent with findings from Dyer et al. [79] who reported that Black MSMW were more likely than Black MSMO to have anal intercourse without condoms while under the influence of alcohol. However, additional research is needed to further characterize differences in the alcohol use patterns of Black MSMO and MSMW and the relationship between alcohol use and sexual behavior. This is especially important given that the increased risk factors experienced by Black MSMW do not translate into increased HIV incidence.

Popular culture understandings of Black MSMW tend to conceptualize men who are non-gay identified and/or who do not disclose their bisexual behavior to their female sexual partners as being on the “down low.” Such men are then viewed as transmitting HIV from gay men to heterosexual women and are often thought to be the reason for the increased rates of HIV among Black heterosexual women

[86]. Despite this popular viewpoint, Black MSMW actually report lower HIV rates than Black MSMO [71, 87–89]. Furthermore, while Black MSM who identify as down low are more likely to have female sexual partners than non-down low identified Black MSM, down-low identity is not associated with engaging in greater sexual risk behavior [90]. In a meta-analysis of HIV prevalence among MSMW, Friedman and Wei [89] found that MSMW were less than half as likely to be HIV-positive as MSMO. This finding was attributed to the fact that MSMW were less likely than MSMO to engage in receptive anal intercourse without a condom, the highest risk sexual activity for HIV transmission [89].

Additionally, Black MSMW may be less integrated into gay communities than Black MSMO [38], and therefore may be protected from the aspects of gay culture that encourage risky behavior, including heavy alcohol consumption. Yet for Black MSMW the role of substance use during sex may function differently with men and women partners [38], and from that of Black MSMO. All these factors must be considered to fully understand the diverse ways in which Black MSM experience their sexuality and substance use. Therefore, examination into the potential moderating role of bisexual behavior (i.e., MSMO vs. MSMW) in the relationship between alcohol and condom use can serve to identify subgroups of Black MSM most at-risk.

### Partner Characteristics

Studies of MSM and non-MSM samples indicate that whether a sexual partner is a new, occasional, or committed partner likely influences the perceived need for condom use [40]. An association between alcohol use during sex and condom use is likely to be attenuated with steady partners [40], but may be enhanced with casual or anonymous sex partners particularly given that alcohol is often used to facilitate sexual encounters with novel and casual partners [72]. Partner characteristics such as gender, HIV status, and substance use may also act to influence the likelihood of risky sex as well as the relationship between alcohol and condom use.

Harawa et al. [91] examined the sexual behavior of 555 Black MSMW. Defining a primary partner as someone “you have lived with or have seen a lot, have had vaginal or anal sex with, and to whom you have felt a special emotional commitment,” Harawa et al. [91] found nearly one-third (28 %) of men reported primary female partners, 34 % reported primary and non-primary female partners, and 38 % reported non-primary female partners. Furthermore, condomless sex was more common and occurred more frequently with primary than non-primary female partners. Men who reported condomless insertive

intercourse with other men were also more likely to report a greater frequency of such risky behavior with women [91]. Similarly, Siegel et al. [92] examined the sexual behavior of a racially diverse (45 % African American) sample of non-gay identified MSMW. Men, none of whom disclosed their bisexual behavior to their female partners, reported more male than female partners. Although condom use did not differ by partner gender, consistent with the findings of Harawa et al. [91], men were more likely to engage in risky sexual behavior with steady than casual partners [92]. Conversely, Operario et al. [84] examined the effect of gender on condom use among Black MSMW and found that the frequency of condom use differed by the gender of sex partners. The majority (71 %) of men reported not using condoms during vaginal sex with women, while fewer men engaged in no condom use during insertive (52 %) or receptive (34 %) anal sex with men [84].

The level of control in a relationship and the ability to initiate condom use may differ between men and women sexual partners [93]. While studies of MSMW often demonstrate less condom use with female partners, especially during vaginal intercourse, than with male partners [73], there is inconsistency in this area. Substance use may attenuate the differential use of condoms between men and women sex partners, such that lower rates of condom use with women sexual partners may be demonstrated among men sexual partners when substances are involved. Similarly, the increased likelihood of protected behaviors with casual partners, in relation to steady partners may diminish as a function of alcohol use. Alcohol not only impairs the implementation of protected sexual behaviors, but it may also influence the likelihood of choosing riskier sexual partners [40]. Factors such as the substance use behaviors [19, 49] and HIV-status of sexual partners may introduce further complexity to the role substance use during sex as well as the relationship between alcohol use and condom use.

A unique area of concern for Black MSM is the high prevalence of transactional sex in which sex is offered or received in exchange for money, drugs, material goods, or something of value (e.g. housing) [94]. Wheeler et al. [71] conducted a study of 1154 Black MSM in New York and Philadelphia. Nearly half (45 %) of men reported participation in exchange sex, either providing sex in exchange for material goods or providing material goods in exchange for sex. This is a particular area of risk for Black MSMW who are significantly more likely than Black MSMO to participate in exchange sex, as the providers and recipients of material goods [79]. Dyer et al. [79] found that being Black MSMW was significantly associated with receiving material goods during recent anal intercourse in which condoms were not used.

There is a need for greater exploration of the degree to which Black MSMSW engage sexually with other men

primarily for access to drugs, money, or other material goods. Siegel et al. [92] explored the behavior of 46 racially diverse non-gay identified MSMW and found that only 2 men reported engaging sexually with men only in exchange sex encounters. Washington and Brocato [95] conducted a qualitative analysis of the HIV prevention needs of Black MSMW substance using sex workers. All the men self-identified as heterosexual and indicated having sex with men only to acquire drugs or money for drugs [95]. Black MSMW substance users may use substances, or the process by which they acquire substances, to act on homosexual desires despite conscious attempts to avoid homosexual behavior [38]. The internalized homophobia of Black MSMW combined with the common practice of trading sex for drugs or money for drugs makes it difficult to truly differentiate Black MSMW who have homosexual desires from those who are willing to engage in homosexual sex solely for access to drugs, money, or other material goods.

The social marginalization of men who are at increased likelihood for homelessness, incarceration, and unemployment may create circumstances in which men feel that exchange sex is necessary for daily survival [73]. In such circumstances, men may be willing to engage in risky sexual behaviors if doing so guarantees them access to needed provision. Additionally, the exchange sex interaction often has a power differential that impedes Black MSMW sex workers' ability for condom negotiation [96]. In the study by Wheeler et al. [71], exchanging sex for money, food, or drugs in the past 3 months was significantly associated with engaging in anal intercourse without a condom in the past 3 months. While it is difficult to fully ascertain the relationship between transactional sex and risky sexual behavior [72], it is plausible that substance use has a significant role in sex with exchange partners and may act to exacerbate the risk of such encounters among Black MSMW. Research in transactional sex with MSM often examines the role of illicit drugs in the exchange. However, understanding the function alcohol serves in exchange sex for Black MSM is warranted.

## Conclusion

MSM experience disproportionate rates of HIV morbidity and mortality and Black MSM are the most at-risk group for HIV infection [2, 3]. Factors commonly associated with HIV risk fail to adequately explain this racial disparity, indicating that the identification of correlates of HIV risk behaviors is multifaceted and complex [7, 97]. A complete understanding of sexual risk among Black MSM likely requires exploration of factors that may be contributing to the epidemic within a multi-systemic model that

understands the ways in which communal, environmental, and social dynamics concurrently influence individuals' behavior. Substance use is one such factor that interacts across system levels to put individuals at risk.

Substance use, alcohol specifically, is highly prevalent among Black MSM. Alcohol use in the context of sex is associated with HIV risk as alcohol use impairs judgment during sexual intercourse, likely reducing the likelihood of condom use [8, 13]. Understanding predictors of condom use is important because condom use is up to 10,000 times more effective in preventing HIV transmission than non-condom use [98]. Although the impaired judgment effect of alcohol use is not unique to MSM, such alcohol-induced lapses in judgment have particular implications for the sexual health of Black MSM and their sexual partners due to elevated HIV rates in this population. However, support for the role of alcohol use in increasing the likelihood of non-condom use during sex is inconsistent. This inconsistency in findings underscores the need for more thorough exploration of this relationship among Black MSM. Assessment of sexual risk at the event, situational, and global level allows for a more complete understanding of sexual behavior in a way not often examined in the literature.

Black MSM are not monolithic in their sexual behaviors nor in their objectives for substance use. Several factors such as binge drinking, sex-related alcohol expectancies, personality traits, partner characteristics, and bisexual behavior may explicate the role of alcohol in the lives of Black MSM as well as the motivation for engaging in alcohol use during sexual activity. Consideration of these factors and their function as moderating variables allows for better characterization of the nuanced role of alcohol in sexual decision-making. It is important to note that, although often examined separately, these variables are not completely independent of each other; instead, they interact, likely moderating each other. Combined with issues of race, sexuality, and gender, Black MSM experience intersection along their social identities and psychosocial factors [99, 100]. This may not fully be captured by independent examination of moderating variables as methodological limitations restrict the degree to which research can fully capture this complexity. Therefore, the practical implications of research that examines the effect of moderators independently must be understood within the intersectionality in which Black MSM live and experience these issues.

Addressing the HIV epidemic among Black MSM warrants understanding correlates of risk among this population. However, the difficulty in this effort is that commonly understood HIV correlates, such as non-condom use during anal intercourse, fail to adequately explain the disproportionate rates of HIV among Black MSM in

comparison to MSM of other racial/ethnic groups. In fact, Black MSM report rates of condom use comparable to that of other MSM groups, while unrecognized HIV infection and having current or prior STIs are among the few factors that significantly explain the racial disparity in HIV infection [15, 101, 102]. Although there is little support for substance use being a significant variable in explaining the HIV racial disparity [15, 101], there is some support for an association between substance use and sexual risk behavior within Black MSM.

Given the significant role that substance use has in MSM sexual cultures, investigation in this area will help identify individuals who are most vulnerable to sexual risk-taking as a function of alcohol use and the conditions under which their risk is exacerbated or attenuated. The study of alcohol as it relates to sexual risk behavior is important for several reasons. Alcohol is unique from most other substances in that it is legal, socially acceptable, and easily accessible. Alcohol use is also normalized and, in many settings, expected even at high levels [103]. The prevalence of alcohol use is high among MSM and MSM may use alcohol to facilitate sexual activity [8]. While alcohol may ease engagement in sexual activity, heavy drinking and subsequent intoxication can interfere with sexual communication and decision-making. The ability to clearly discuss and negotiate sexual interests, preferences, behaviors, and condom use is likely to be diminished when intoxicated. This impaired ability may lead to inconsistent condom use. Among men living with HIV, such alcohol-induced impairment in decision-making has the potential for transmitting HIV to uninfected partners. Non-condom use can also result in risk of transmitting, as well as contracting other STIs, which can increase the chances of illness among people living with HIV.

For men living with HIV, alcohol use has particular health implications that extend beyond just sexual behavior. Alcohol can weaken the immune system and lower CD4 cell counts, compromising the body's ability to fight the virus [104]. Alcohol use can also increase the likelihood that people living with HIV will be non-compliant with their treatment regimen. This has deleterious effects on the course of the disease as taking medication intermittently can result in developing treatment resistant strains of the virus, which has implications for men's long-term prognosis [8, 105]. Men who drink heavily or have more severe alcohol problems are also more likely to be medically non-compliant [105]. In sum, understanding the relationship between alcohol and sexual risk among MSM, and Black MSM in particular, represents a highly significant research area in light of the HIV epidemic in this group and the role of alcohol in acquiring, spreading, and treating HIV infection.

The role of alcohol in the lives of Black MSM is complex and presents multiple pathways by which to effect

HIV morbidity, mortality, and transmission. As the most at-risk group for HIV infection, there is increased interest in the addressing HIV among Black MSM [6]. However, a focus on HIV among Black MSM requires a comprehensive and culturally sensitive exploration of correlates of sexual risk for these men, such as alcohol use. Such research can inform the risk-reduction content of HIV/AIDS prevention efforts tailored to meet the unique needs of Black MSM, of which there are few [106], with the goal of reducing the disparate rate of HIV among this population.

## References

- Centers for Disease Control and Prevention: HIV among Black/ African American gay, bisexual, and other men who have sex with men (2013). [http://www.cdc.gov/hiv/pdf/risk\\_HIV\\_among\\_Black\\_AA\\_Gay.pdf](http://www.cdc.gov/hiv/pdf/risk_HIV_among_Black_AA_Gay.pdf). Accessed 10 Dec 2013.
- Centers for Disease Control and Prevention: HIV among African Americans (2012). <http://www.cdc.gov/hiv/topics/aa/index.htm>. Accessed 7 Nov 2012.
- Centers for Disease Control and Prevention: HIV among Latinos (2011). <http://www.cdc.gov/hiv/latinos/index.htm>. Accessed 7 Nov 2012.
- Stall R, Duran L, Wisniewski SR, Friedman MS, Marshal MP, McFarland W, et al. Running in place: implications of HIV incidence estimates among urban men who have sex with men in the United States and other industrialized countries. *AIDS Behav*. 2009;13(4):615–29.
- Centers for Disease Control and Prevention. Prevalence and awareness of HIV infection among men who have sex with men—21 cities, United States, 2008. *Morb Mortal Weekly Rep*. 2010;59(37):1201–7.
- Centers for Disease Control and Prevention: HIV among gay and bisexual men (2012). <http://www.cdc.gov/hiv/topics/msm/index.htm>. Accessed 7 Nov 2012.
- Mustanski BS, Newcomb ME, Du Bois SN, Garcia SC, Grov C. HIV in young men who have sex with men: a review of epidemiology, risk and protective factors, and interventions. *J Sex Res*. 2011;48(2–3):218–53.
- Centers for Disease Control and Prevention: HIV and substance use in the United States (2013). [http://www.cdc.gov/hiv/pdf/risk\\_HIV\\_Substance.pdf](http://www.cdc.gov/hiv/pdf/risk_HIV_Substance.pdf). Accessed 17 Dec 2013.
- Stall R, Paul J, Greenwood G, Pollack L, Bein E, Crosby G, et al. Alcohol use, drug use and alcohol-related problems among men who have sex with men: the Urban Men's Health Study. *Addiction*. 2001;96:1589–601.
- Cochran S, Ackerman D, Mays V, Ross M. Prevalence of non-medical drug use and dependence among homosexually active men and women in the US population. *Addiction*. 2004;99(8):989–98.
- Centers for Disease Control and Prevention: Excessive alcohol use and risks to men's health (2013). <http://www.cdc.gov/alcohol/fact-sheets/mens-health.htm>. Accessed 20 Dec 2013.
- Vosburgh HW, Mansergh G, Sullivan PS, Purcell DW. A review of the literature on event-level substance use and sexual risk behavior among men who have sex with men. *AIDS Behav*. 2012;16:1394–410.
- Steele CM, Josephs RA. Alcohol myopia: its prized and dangerous effects. *Am Psychol*. 1990;45:921–33.
- Rosenberg E, Kelley C, O'Hara B, Frew P, Peterson J, Sanchez T, et al (2012). Equal behaviors, unequal risks: the role of

- partner transmission potential in racial HIV disparities among men who have sex with men (MSM) in the US. In: International AIDS Conference, Washington, DC, 2012.
15. Millett GA, Peterson JL, Flores SA, Hart TA, Jeffries WL, Wilson PA, et al. Comparisons of disparities and risks of HIV infection in Black and other men who have sex with men in Canada, UK, and USA: a meta-analysis. *Lancet*. 2012;380:341–8.
  16. Bux DA. The epidemiology of problem drinking in gay men and lesbians: a critical review. *Clin Psychol Rev*. 1996;16:277–98.
  17. Stall R, Purcell D. Intertwining epidemics: a review of research on substance use among men who have sex with men and its connection to the AIDS epidemic. *AIDS Behav*. 2000;4:181–92.
  18. Stall R, Wiley J. A comparison of drug and alcohol use habits of heterosexual and homosexual men. *Drug Alcohol Depend*. 1988;22:63–74.
  19. Reisner SL, Mimiaga MJ, Bland S, Skeer M, Cranston K, Isenberg D, et al. Problematic alcohol use and HIV risk among Black men who have sex with men. *AIDS Care*. 2010;22(5):577–87.
  20. Knox S, Kippax S, Crawford J, Prestage G, Van De Ven P. Non-prescription drug use by gay men in Sydney, Melbourne and Brisbane. *Drug Alcohol Rev*. 1999;18:425–33.
  21. Bergmark KH. Drinking in the Swedish gay and lesbian community. *Drug Alcohol Depend*. 1999;56:133–43.
  22. Celentano D, Valleroy L, Sifakis F, MacKellar D, Hylton J, Thiede H, et al. Associations between substance use and sexual risk among very young men who have sex with men. *Sex Transm Dis*. 2006;33(4):265–71.
  23. Cochran S, Keenan C, Schober C, Mays V. Estimates of alcohol use and clinical treatment needs among homosexually active men and women in the U.S. population. *J Consult Clin Psychol*. 2000;68:1062–71.
  24. Colfax G, Vittinghoff E, Husnik M, McKirnan D, Buchbinder S, Koblin B, et al. Substance use and sexual risk: a participant and episode-level analysis among a cohort of men who have sex with men. *Am J Epidemiol*. 2004;159(10):1002–12.
  25. Drabble L, Midanik L, Trocki K. Reports of alcohol consumption and alcohol-related problems among homosexual, bisexual and heterosexual respondents: results from the 2000 National Alcohol Survey. *J Stud Alcohol*. 2005;66:111–20.
  26. Irwin T, Morgenster J. Drug-use patterns among men who have sex with men presenting for alcohol treatment: differences in ethnic and sexual identity. *J Urban Aff*. 2005;82:127–33.
  27. McKirnan D, Peterson P. Alcohol and drug use among homosexual men and women: epidemiology and population characteristics. *Addict Behav*. 1989;14:545–53.
  28. Skinner W, Otis M. Drug and alcohol use among lesbian and gay people in a Southern U.S. sample: epidemiological, comparative, and methodological findings from the Trilogy Project. *J Homosex*. 1996;30:59–92.
  29. National Institute on Alcohol Abuse and Alcoholism: Module 10G: Sexual orientation and alcohol use disorders (2004). <http://pubs.niaaa.nih.gov/publications/Social/Module10GSexualOrientation/Module10G.html>. Accessed 15 Jan 2014.
  30. Substance Abuse and Mental Health Services Administration. Results from the 2012 National Survey on Drug Use and Health: summary of national findings. SAMHSA: Rockville, MD; 2013.
  31. Substance Abuse and Mental Health Services Administration: Behavioral health and Black/African Americans: from the National Survey on Drug Use and Health, 2010 (2010). <http://www.samhsa.gov/obhe/african-american.aspx>. Accessed 14 Jan 2014.
  32. Caetano R, Clark CL. Trends in alcohol consumption patterns among Whites, Blacks and Hispanics: 1984 and 1995. *J Stud Alcohol*. 1998;59:659–68.
  33. Grant B, Dawson D, Stinson F, Chou S, Dufour M, Pickering R. The 12-month prevalence and trends in DSM-IV alcohol abuse and dependence: United States, 1991-1992 and 2001-2002. *Drug Alcohol Depend*. 2004;74:223–34.
  34. Raj A, Reed D, Santana MC, Walley AY, Welles SL, Horsburgh CR, et al. The associations of binge alcohol use with HIV/STI risk and diagnosis among heterosexual African American men. *Drug Alcohol Depend*. 2009;101:101–6.
  35. Substance Abuse and Mental Health Services Administration. Results from the 2006 National Survey on Drug Use and Health: national findings. Rockville: Office of Applied Studies; 2007.
  36. Ewing JA. Detecting alcoholism: the CAGE questionnaire. *JAMA*. 1984;252:1905–7.
  37. Tobin K, Davey-Rothwell M, Yang C, Siconolfi D, Latkin C. An examination of associations between social norms and risky alcohol use among African American men who have sex with men. *Drug Alcohol Depend*. 2014;134:218–21.
  38. Harawa NT, Williams JK, Ramamurthi HC, Manago C, Avina S, Jones M. Sexual behavior, sexual identity, and substance abuse among low-income bisexual and non-gay-identifying African American men who have sex with men. *Arch Sex Behav*. 2008;37:748–62.
  39. Leigh BC. Alcohol and condom use: a meta-analysis of event-level studies. *Sex Transm Dis*. 2002;29(8):476–82.
  40. Weinhardt L, Carey M. Does alcohol lead to sexual risk behavior? Findings from event-level research. *Annu Rev Sex Res*. 2000;11(1):125–57.
  41. Hirschfield S, Remien R, Humberstone M, Walavalkar I, Chisasson M. Substance use and high-risk sex among men who have sex with men: a national online study in the USA. *AIDS Care*. 2004;16:1036–47.
  42. Purcell D, Moss S, Remien R, Woods W, Parson J. Illicit substance use, sexual risk, and HIV-positive gay and bisexual men: differences by serostatus of casual partners. *AIDS*. 2005;19:S37–47.
  43. Wilton L. Correlates of substance use in relation to sexual behavior in black gay and bisexual men: implications for HIV prevention. *J Black Psychol*. 2008;34:70–93.
  44. Greenwood G, White E, Page-Shafer K, Bein E, Osmond D, Paul J, et al. Correlates of heavy substance use among young gay and bisexual men: the San Francisco Young Men's Health Study. *Drug Alcohol Depend*. 2001;61(2):105–12.
  45. Wolitski R, Stall R, Valdiserri R. Unequal opportunity: health disparities affecting gay and bisexual men in the United States. New York: Oxford University Press; 2008.
  46. McKirnan D, Vanable P, Ostrow D, Hope B. Expectancies of sexual "escape" and sexual risk among drug and alcohol-involved gay and bisexual men. *J Subst Abuse*. 2001;13:137–54.
  47. Irwin T, Morgenster J, Parson J, Wainberg M, Labouvie E. Alcohol and sexual HIV risk behavior among problem drinking men who have sex with men: an event level analysis of timeline followback data. *AIDS Behav*. 2006;10:299–307.
  48. McKirnan D, Ostrow DG, Hope B. Sex, drugs, and escape: a psychological model of HIV-risk sexual behaviors. *AIDS Care*. 1996;8:655–69.
  49. Martinez O, Dodge B, Reece M, Schnarrs PW, Rhodes SD, Goncalves G, et al. Sexual health and life experiences: voices from behaviourally bisexual Latino men in the Midwestern USA. *Cult Health Sex*. 2011;13(9):1073–89.
  50. Semple SJ, Patterson TL, Grant I. Motivations associated with methamphetamine use among HIV+ men who have sex with men. *J Subst Abuse Treat*. 2002;22(3):149–56.
  51. Apostolopoulos Y, Sonmez S, Yu CH. HIV-risk behaviours of American spring break vacationers: a case of situational disinhibition? *Int J STD AIDS*. 2002;13:733–43.
  52. MacAndrew C, Edgerton RB. Drunken comportment: a social explanation. Oxford: Aldine; 1969.
  53. Maisto SA, Palfai T, Vanable PA, Heath J, Woolf-King SE. The effects of alcohol and sexual arousal on determinants of sexual

- risk in men who have sex with men. *Arch Sex Behav.* 2012;41:971–86.
54. Bimbi DS, Nanin JE, Parsons JT, Vicioso KJ, Missildine W, Frost DM. Assessing gay and bisexual men's outcome expectancies for sexual risk under the influence of alcohol and drugs. *Subst Use Misuse.* 2006;41(5):643–52.
  55. Kalichman SC, Tannenbaum L, Nachimson D. Personality and cognitive factors influencing substance use and sexual risk for HIV infection among gay and bisexual men. *Psychol Addict Behav.* 1998;12(4):262–71.
  56. Caetano R, Clark CL, Tam T. Alcohol consumption among racial/ethnic minorities: theory and research. *Alcohol Health Res World.* 1998;22(4):233–8.
  57. Mimiaga MJ, Reisner SL, Bland SE, Driscoll MA, Cranston K, Isenberg D, et al. Sex parties among urban MSM: an emerging culture and HIV risk environment. *AIDS Behav.* 2011;15(2):305–18.
  58. Newcomb ME, Clerkin EM, Mustanski B. Sensation seeking moderates the effects of alcohol and drug use prior to sex on sexual risk in young men who have sex with men. *AIDS Behav.* 2011;15(3):565–75.
  59. Berg RC. Barebacking among MSM internet users. *AIDS Behav.* 2008;12(5):822–33.
  60. Adam PCG, Teva I, deWit JBF. Balancing risk and pleasure: sexual self-control as a moderator of the influence of sexual desires on sexual risk-taking in men who have sex with men. *Sex Transm Dis.* 2008;84(6):463–7.
  61. Patterson TL, Semple SJ, Zians J, Strathdee SA. Methamphetamine-using HIV-positive men who have sex with men: correlates of polydrug use. *J Urban Health.* 2005;82(1):120–6.
  62. Klein H. Anonymous sex and HIV risk practices among men using the internet specifically to find male partners for unprotected sex. *Public Health.* 2012;126(6):471–81.
  63. Semple SJ, Zians J, Grant I, Patterson TL. Methamphetamine use, impulsivity, and sexual risk behavior among HIV-positive men who have sex with men. *J Addict Dis.* 2006;25(4):105–14.
  64. Hays RB, Paul J, Ekstrand M, Kegeles SM, Stall R, Coates TJ. Actual versus perceived HIV status, sexual behaviors and predictors of unprotected sex among young gay and bisexual men who identify as HIV-negative, HIV-positive and untested. *AIDS.* 1997;11(12):1495–502.
  65. Dickman SJ. Functional and dysfunctional impulsivity: personality and cognitive correlates. *J Pers Soc Psychol.* 1990;58(1):95.
  66. Spear LP. The adolescent brain and age-related behavioral manifestations. *Neurosci Biobehav Rev.* 2000;24(4):417–63.
  67. Greene E, Frye V, Mansergh G, Colfax GN, Hudson SM, Flores SA, et al. Correlates of unprotected vaginal or anal intercourse with women among substance-using men who have sex with men. *AIDS Behav.* 2013;17:889–99.
  68. Millett G, Malebranche D, Mason B, Spikes P. Focusing "down low": bisexual black men, HIV risk and heterosexual transmission. *J Natl Med Assoc.* 2005;97(7 Suppl):52S.
  69. Sanchez T, Finlayson T, Drake A, Behel S, Cribbin M, Dinetto E, et al. Human immunodeficiency virus (HIV) risk, prevention, and testing behaviors—United States, National HIV Behavioral Surveillance System: men who have sex with men, November 2003–April 2005. *Morb Mortal Weekly Rep.* 2006;55(SS06):1–16.
  70. Mosher W, Chandra A, Jones J. Sexual behavior and selected health measures: men and women 15–44 years of age, United States, 2002. *Adv Data.* 2005;362:1–55.
  71. Wheeler D, Lauby J, Liu K, Van Sluytman L, Murrill C. A comparative analysis of sexual risk characteristics of Black men who have sex with men or with men and women. *Arch Sex Behav.* 2008;37(5):697–707.
  72. Knight KR, Shade SB, Purcell DW, Rose CD, Metsch LR, Latka MH, et al. Sexual transmission risk behavior reported among behaviorally bisexual HIV-positive injection drug-using men. *J Acquir Immune Defic Syndr.* 2007;46(S2):S80–7.
  73. Gorbach PM, Murphy R, Weiss RE, Hucks-Ortiz C, Shoptaw S. Bridging sexual boundaries: men who have sex with men and women in a street-based sample in Los Angeles. *J Urban Health.* 2009;86(1):S63–76.
  74. Zule WA, Bobashev GV, Wechsberg WM, Costenbader EC, Coomes CM. Behaviorally bisexual men and their risk behaviors with men and women. *J Urban Health.* 2009;86(1):548–62.
  75. Dodge B, Jeffries W, Sandfort T. Beyond the down low: sexual risk, protection, and disclosure among at-risk Black men who have sex with both men and women (MSMW). *Arch Sex Behav.* 2008;37:683–96.
  76. Goodenow C, Netherland J, Szalacha L. AIDS-related risk among adolescent males who have sex with males, females, or both: evidence from a statewide survey. *Am J Public Health.* 2002;92:203–10.
  77. Jeffries W, Dodge B. Male bisexuality and condom use at last sexual encounter: results from a national survey. *J Sex Res.* 2007;44:278–89.
  78. Heckman T, Kelly J, Sikkema K, Roffman R, Solomon L, Winett R, et al. Differences in HIV risk characteristics between bisexual and exclusively gay men. *AIDS Educ Prev.* 1995;7(6):504–12.
  79. Dyer TP, Regan R, Wilton L, Harawa NT, Ou SS, Wang L, et al. Differences in substance use, psychosocial characteristics and HIV-related sexual risk behavior between Black men who have sex with men only (BMSMO) and Black men who have sex with men and women (BMSMW) in six US cities. *J Urban Health.* 2013;90(6):1181–93.
  80. Reisner SL, Mimiaga MJ, Skeer M, Bright D, Cranston K, Isenberg D, et al. Clinically significant depressive symptoms as a risk factor for HIV infection among black MSM in Massachusetts. *AIDS Behav.* 2009;13(4):798–810.
  81. Maulsby C, Millett G, Lindsey K, Kelley R, Johnson K, Montoya D, et al. HIV Among Black men who have sex with men (MSM) in the United States: a review of the literature. *AIDS Behav.* 2013;18(1):1–16.
  82. Agronick G, O'Donnell L, Stueve A, Doval A, Duran R, Vargo S. Sexual behaviors and risks among bisexually and gay-identified young Latino men. *AIDS Behav.* 2004;8:185–97.
  83. Dodge B, Sandfort T. A review of mental health research on bisexual individuals when compared to homosexual and heterosexual individuals. In: Firestein B, editor. *Becoming visible: counseling bisexuals across the lifespan.* New York: Columbia University Press; 2007.
  84. Operario D, Smith C, Arnold E, Kegeles S. Sexual risk and substance use behaviors among African American men who have sex with men and women. *AIDS Behav.* 2011;17:576–83.
  85. Wohl A, Johnson D, Lu S, Jordan W, Beall G, Currier J, et al. HIV risk behaviors among African American men in Los Angeles County who self-identify as heterosexual. *J Acquir Immune Defic Syndr.* 2002;31(3):354–60.
  86. Ford CL, Whetten KD, Hall SA, Kaufman JS, Thrasher AD. Black sexuality, social construction, and research targeting 'The Down Low' ('The DL'). *Ann Epidemiol.* 2007;17(3):209–16.
  87. Harawa NT, Williams JK, McCuller WJ, Ramamurthi HC, Lee M, Shapiro MF, et al. Efficacy of a culturally congruent HIV risk-reduction intervention for behaviorally bisexual Black men: results of a randomized trial. *AIDS.* 2013;27(12):1979–88.
  88. Montgomery JP, Mokotoff ED, Gentry AC, Blair JM. The extent of bisexual behaviour in HIV-infected men and implications for transmission to their female sex partners. *AIDS Care.* 2003;15(6):829–37.
  89. Friedman MR, Wei C, Klem ML, Silvestre AJ, Markovic N, Stall R. HIV infection and sexual risk among men who have sex with men and women (MSMW): a systematic review and meta-analysis. *PLoS ONE.* 2014;9(1):e87139.

90. Bond L, Wheeler DP, Millett GA, LaPollo AB, Carson LF, Liau A. Black men who have sex with men and the association of down-low identity with HIV risk behavior. *Am J Public Health*. 2009;99(1):S92.
91. Harawa N, Wilton L, Wang L, Mao C, Kuo I, Penniman T, et al. Types of female partners reported by Black men who have sex with men and women (MSMW) and associations with intercourse frequency, unprotected sex and HIV and STI prevalence. *AIDS Behav*. 2014;18(8):1548–59.
92. Siegel K, Schrimshaw EW, Lekas H-M, Parsons JT. Sexual behaviors of non-gay identified non-disclosing men who have sex with men and women. *Arch Sex Behav*. 2008;37(5):720–35.
93. Amaro H. Love, sex, and power: considering women's realities in HIV prevention. *Am Psychol*. 1995;50:437–47.
94. Harawa NT, Williams JK, Ramamurthi HC, Bingham TA. Perceptions towards condom use, sexual activity, and HIV disclosure among HIV-positive African American men who have sex with men: implications for heterosexual transmission. *J Urban Health*. 2006;83(4):682–94.
95. Washington T, Brocato J. Exploring the perspectives of substance abusers Black men who have sex with men and women in addiction treatment programs: a need for human sexuality educational model for addiction professionals. *Am J Mens Health*. 2011;5(5):402–12.
96. Oldenburg CE, Perez-Brumer AG, Reisner SL, Mimiaga MJ. Transactional sex and the HIV epidemic among men who have sex with men (MSM): results from a systematic review and meta-analysis. *AIDS Behav*. 2015. doi:[10.1007/s10461-015-1010-5](https://doi.org/10.1007/s10461-015-1010-5).
97. Bronfenbrenner U. *The ecology of human development: experiments by nature and design*. Cambridge: Harvard University Press; 1979.
98. Carey RF, Herman WA, Retta SM, Rinaldi JE, Herman BA, Athey TW. Effectiveness of latex condoms as a barrier to human immunodeficiency virus-sized particles under conditions of simulated use. *Sex Transm Dis*. 1992;19(4):230–4.
99. Dyer TP, Shoptaw S, Guadamuz TE, Plankey M, Kao U, Ostrow D, et al. Application of syndemic theory to Black men who have sex with men in the Multicenter AIDS Cohort Study. *J Urban Health*. 2012;89(4):697–708.
100. Goff PA, Leone D, Lewis BA, Kahn KB. Racism leads to pushups: how racial discrimination threatens subordinate men's masculinity. *J Exp Soc Psychol*. 2012;48(5):1111–6.
101. Feldman MB. A critical literature review to identify possible causes of higher rates of HIV infection among young Black and Latino men who have sex with men. *J Natl Med Assoc*. 2010;102(12):1206.
102. Millett GA, Peterson JL, Wolitski RJ, Stall R. Greater risk for HIV infection of Black men who have sex with men: a critical literature review. *Am J Public Health*. 2006;96(6):1007.
103. Mutchler MG, McDavitt B, Gordon KK. "Becoming Bold": alcohol use and sexual exploration among Black and Latino young men who have sex with men (YMSM). *J Sex Res*. 2013;51(6):696–710.
104. Baum MK, Rafie C, Lai S, Sales S, Page JB, Campa A. Alcohol use accelerates HIV disease progression. *AIDS Res Hum Retroviruses*. 2010;26(5):511–8.
105. Grodensky CA, Golin CE, Ochter RD, Turner BJ. Systematic review: effect of alcohol intake on adherence to outpatient medication regimens for chronic diseases. *J Stud Alcohol Drugs*. 2012;73(6):899.
106. Centers for Disease Control and Prevention. HIV infection among young Black men who have sex with men—Jackson, Mississippi, 2006–2008. *Morb Mortal Weekly Rep*. 2009;58(04):77–81.