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# Sexual Identity and Sexual Behavioral Risks Among Black Men in the United States

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This is to certify that the doctoral study by

Darnell Winston Walker

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and that any and all revisions required by
the review committee have been made.

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Walden University
2023

Abstract

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MPH, Kaplan University Fort Lauderdale Florida, 2012

BS, Virginia Commonwealth University Richmond Virginia, 1996

Doctoral Study Submitted in Full Fulfillment

of the Requirements for the Degree of

Doctor of Public Health

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Abstract

In the United States, Black men who have sex with men (MSM) and Black heterosexual women have higher incidence and prevalence of HIV infection compared to all other races and ethnicities. Research has not fully explained these disparities despite this population having similar risk behaviors of other races/ethnicities of MSM. This quantitative cross-sectional study examined whether a relationship existed between self-reported sexual identity and behavioral sex risks among Black MSM aged 18-40 residing in three U.S. cities. Questionnaire data from the SAPTCH, a multisite study was analyzed using logistic regression models. The bisexual bridge theory was used in this study and established a relationship between two groups: sexual identity/orientation, disclosure/condom use, and bisexual men. The analysis showed no statistically significant relationship between sexual identity and behavioral sexual risks among men and women. The results showed a relationship between sexual identity and sexual disclosure to female partners, but no relationship related to the female partner type existed. Moreover, the results of sexual identity and sexual behaviors showed a relationship with sexual behaviors with men only but failed to show a relationship with equal numbers of men and women. This research indicated that future examination should investigate sexual identity along with high-risk sexual behaviors which result in the outcome of HIV infection among Black MSM and Black heterosexual women. The results have positive implications for positive social change and support the development of a community-based syndemic prevention focus on two high-risk populations of Black MSM and Black heterosexual women, thus decreasing new HIV infection rates.

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# Dedication

This professional achievement is dedicated to the loving memory of my mother, Mrs. Mary Joyce “Joy” Walker (Rest in Heaven). My beautiful and inspirational mother provided me with unwavering love and the motivation to keep going even when there were times when I wanted to give up. You always gave me incessant encouragement. I will always appreciate everything you have done for me, especially your willingness to sacrifice to ensure I achieve my dreams and goals. Your presence was important in my achieving my goal. I know you are looking down on me are proud of my accomplishment. Until we meet again, may you continue to send your blessings down on me from Paradise.

**Acknowledgments**

First, I would like to acknowledge and praise God as my Lord and Savior. Philippians 4:13, “I can do all things through Christ which strengthens me.”. I want to acknowledge and thank my Chair, Dr. Jamuir Robinson, who guided me in the final stages of this process by providing me with positive feedback when reviewing my progress. I would also like to acknowledge and thank Dr. Curt Sobolewski and Dr. Sanggon Nam for their constructed review of my research study and for providing outstanding feedback for their support through this research process.

I want to acknowledge and extend a special thank you to my son, Jules Walker, who supported and encouraged me and who provided the best care to my mother, his grandmother (Joy) which allowed me the opportunity to fulfill my dream, I want to also acknowledge my two grandchildren, Brandon Hopkins and Jaelyn Walker, I hope I have shown you anything is possible if you have God, patience, and perseverance. Lastly, I want to acknowledge two brothers, Donnie, and James Walker, for their words of encouragement throughout this personal journey. Throughout this process, I have learned that the loss of my mother, bereavement, and life challenges only made me more determined to complete this study.

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## Section 1: Foundation of the Study and Literature Review

Since the 1980s HIV epidemic, men who have sex with men (MSM) have been disproportionately affected by HIV infection (Sullivan et al., 2014). In the early decades of the epidemic, HIV was considered a disease only affecting young middle-class White MSM (Moore, 2011). But HIV infection became a disease affecting all racial/ethnic groups and all socioeconomic status individuals and is now considered a demographically diverse disease (Moore, 2011). In the United States, HIV is intertwined with the sex and gender of minority groups and continues to be a significant public health concern (Tran & Welles, 2019).

At the beginning HIV epidemic, the first generation of HIV-infected men faced deadly consequences and an uncertain future mainly due to delays in seeking medical care and a lack of treatment options (Dangerfield et al., 2016). In the past decade, there have been significant advances in HIV infection treatment and medications to suppress viral loads to undetectable rates (CDC, 2022). Although these medications decrease the transmission of HIV infection, Black populations continue to rise in new HIV infection diagnoses (CDC, 2022).

Past decades have reported high incidence rates of HIV infection in the Black population, surpassing all other races/ethnicities (Centers for Disease Control and Prevention [CDC], 2022). In 2019 gay and bisexual men comprised 25,552 (69%) of the total of 36,801 new diagnoses of HIV infection (CDC, 2022). Of the total number in 2019, Black gay and bisexual men accounted for 9,421, representing 37% of the new HIV infection diagnosis surpassing rates of all other gay and bisexual men (CDC, 2022).

In 2020, Blacks represented 13.4% of the U.S. population yet represented 42 % (12,827) of new HIV diagnoses, higher than all other races and ethnicities (CDC, 2022). Gay and bisexual men comprise approximately 2% of the U.S. population yet represent three-fourths of new infections (Crosby et al., 2016). The highest rates of HIV infection are concentrated in groups of Black gay, bisexual, same-gender loving, and other sexual identity categories of men (Dacus & Sandfort, 2020). More importantly, in the U.S., Black gay and bisexual men and older MSM have been associated with a 50% risk of HIV infection throughout their lifetime (Dangerfield et al., 2018).

Research has identified another high-risk group of young Black MSM, with rates exceeding White and Hispanic MSM and the overall rates of U.S. subpopulations (Crosby et al., 2016). Young Black adolescents who engage in sex with men have been associated with an increased risk for HIV infection and worse health outcomes than heterosexual adolescents (Herrick et al., 2014). Young Black men are highly vulnerable to HIV infection due mainly to a lack of knowledge of their HIV status and failure to get tested (CDC, 2020a). In addition, young Black men believe HIV treatment limits their risk, leading to underestimating their risk factors for HIV infection (Crosby et al., 2016). According to the CDC (2022), those 13–34 constitute over half (57%) of new HIV diagnoses. Consequently, Black, gay, and bisexual men aged 13 to 34 accounted for 26% (3 out of every 4) of HIV infection diagnoses (CDC, 2020a).

Individual risk factors for HIV infection are related to sociodemographic characteristics, including low SES, age, gender, ethnicity, sexuality, drug use, and sex workers (Dangerfield et al., 2016). Significant in HIV infection transmission are the

numerous additional risks associated with exposure type and behaviors (CDC, 2022). Equally important in HIV infection transmission are individual social relationships related to sexual networks (CDC, 2020b).

Factors related to stigma, higher numbers of sex partners, and unprotected sexual intercourse are also significant transmission factors (CDC, 2020). Sexual intercourse is a significant transmission mode for HIV infection due to the exchange of blood, semen, and rectal/vaginal fluids (CDC, 2022). In 2019, male-to-male sexual contact (MMSC) and heterosexual contact accounted for the high numbers of new diagnoses of HIV infection, with rates reported at 80% and 90%, respectively (CDC, 2022).

In populations of men, male-to-male contact is a significant risk in the high incidence and prevalence of HIV infection and STDs (CDC, 2020b). Accumulating research indicated among Black MSM, the high HIV infection rates could result from complicated relationships with health providers and involves behavioral, social, structural, and network influences (Maulsby et al., 2015). Research findings have identified additional risk factors as lack of HIV testing, undiagnosed HIV infection, lack of adherence to HIV medical regime regimens, length of time of viral suppression, and partner types (Maulsby et al., 2015).

Further, disparities in high rates of HIV/AIDS in the Black and Latino population relate to exposures related to toxic social environment and social circumstances which facilitate transmission of HIV in minority groups (Wilson et al., 2014). *Syndemic* is “two or more afflictions, interacting synergistically, contributing to excess burden of disease in populations” (Wilson et al., 2014, p.785). Two specific syndemic influences in HIV

infection spread are the disease and social conditions (Achterbergh et al., 2017).

Syndemic influences involves social environments including urban sprawl and low SES, which when combined with social conditions, can lead to increased risk for HIV infection (Smith et al., 2022). Additional syndemic risks include behaviors, psychological health issues, drug use, prejudice, maltreatment, stigma, and high STD risk in Black MSM (Achterbergh et al., 2017). Multifaceted health and social issues develop in high-risk groups which makes syndemic theory a useful framework for HIVAIDS examination (Smith et al., 2022; Wilson et al., 2014).

HIV infection is still considered a life-threatening virus which causes acquired immunodeficiency syndrome (AIDS), inhibiting immune system responses (CDC, 2020). Equally important is the high prevalence of HIV infection and STDs in the MSM population (CDC, 2020). Black MSM are reported to have higher numbers of STDs related to decreased immune systems causing a higher degree of susceptibility to the transmission of HIV infection (Wilson & Moore, 2009). However, condoms significantly reduce the chance of contracting HIV infection transmitted through genital fluids (CDC, 2022). Using condoms correctly also decreases the likelihood of contracting STDs through sores, including human papillomavirus, genital herpes, and syphilis (CDC, 2022). Maintaining an undetectable viral load (viral suppressions) also decreases HIV transmission to others using intravenous drugs where needles and syringes are shared (CDC, 2022).

This first section will discuss the foundation for this study, the problem statement, the purpose of the study, research questions and hypothesis, and the theoretical

foundation for this study. Next, the section covers the literature review strategy forming this study's basis and the literature review of key concepts. This section will also discuss the nature of the study, assumptions, limitations, and delimitations of this study.

## Background

In the early 1980s, public health identified an epidemiological category of men characterized as MSM (Lifson, 1992; Rutledge et al., 2018). This constructed category of MSM focuses on behaviors as opposed to identity, orientation, or other theories related to male same-sex behaviors (Rutledge et al., 2018). The use of the category of MSM has been the subject of debate in public health and gay and lesbian populations (Rutledge et al., 2018). Research has characterized MSM and MSMW as being a single subcategory of MSM (McCree et al., 2017). But social and circumstantial conditions influence MSMW, which characterizes them differently from men who have sex with men only (MSMO; McCree et al., 2017). MSMW is associated with two groups of sexual networks—male-male and male-female—which may affect HIV transmission and acquisition in groups of MSMW (Jefferies, 2014; McCree et al., 2017). Approximately 35% of MSM sexual behaviors are associated with MSMW and the possible transmission risk to women (McCree et al., 2017). Expressions used by bisexuals insinuate behaviors include significant risks along with secrecy, exposing female partners (Friedman et al., 2016).

In the early 1990s, at the peak of the HIV epidemic, a review of the literature related to Black MSM described them using a negative identity known as "down low" or "DL" (Friedman et al., 2014). The category of down low has been identified in public health research in Black communities and symbolizes a subculture of the Black men

population (Friedman et al., 2014). Black men on the down low originated from the overall MSM population and differed from the heterosexual population (Friedman et al., 2014). Consequently, MSM who are self-reported as being gay face humiliation in Black communities, which encourages the down low phenomenon, where men identify as being heterosexual while engaging in secret same-sex behaviors with men (Oser et al., 2017). In public health research, the variable of down low presents issues in understanding MSM who fail to disclose their sexual behaviors (Malebranche et al., 2010). By contrast, in the United States, bisexual men live what is labeled as a "double closet," which causes them not to disclose their heterosexual behaviors to their gay friends and not disclosing their homosexual behaviors to their heterosexual friends (Friedman et al., 2019; McLean, 2001; Zinik, 1985).

The theoretical perspective of the bisexual bridge theory implies MSM living on the down low are associated with high-risk behavioral bisexual sex practices (O'Leary & Jones, 2006). Additionally, MSMW may be a possible route for HIV infection transmission to women who have sex with men (WSM) (O'Leary & Jones, 2006). Having anal intercourse is a significant transmission route of HIV infection (Zula et al., 2009). Research investigating MSMW indicated men who live a secretive lifestyle are less likely to use condoms with their female partners and more likely to have anal sex (Zula et al., 2009). Furthermore, individual social relationships related to sexual networks, stigma, a higher number of sex partners, and unprotective sexual intercourse are also significant transmission factors (CDC, 2020b). As a result, these factors, along with other health-related disparities, include sexual identity/orientation and men who

identify as heterosexual (Raj & Bowleg, 2012; Rutledge et al., 2018).

Studies conducted on MSM based on behavioral characteristics in all races and ethnicities have confirmed dissimilarities between men who have sex with men only and MSMW (Rutledge et al., 2018). Previous studies have reported MSMW tend to be younger, Black, identify as heterosexual, have low incomes, and fail to disclose their same behaviors (Rutledge et al., 2018). It is crucial to evaluate risk factors to assess the magnitude of risk for HIV infection and other viral infections (Goldstein et al., 2015). The high incidence and prevalence of HIV infection in the Black population require studies on risk and protective factors (Raj & Bowleg, 2012; Rutledge et al., 2018).

**Black HIV/AIDS: A Brief Overview**

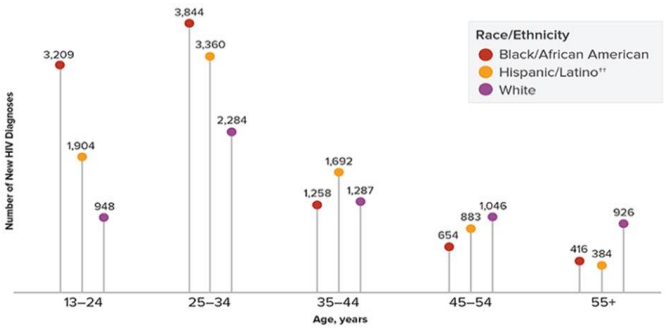
In past decades, the incidence and prevalence of HIV/AIDS have been considered a public emergency for Black populations (CDC, 2022). From 1996 through the present day, Blacks have represented the highest population diagnosed with AIDS compared to all other racial/ethnic groups (Johnson et al., 2010). In 1982 there were 400 cases of AIDS, with Blacks representing 19% of these AIDS cases (Johnson et al., 2010). Despite early percentages of AIDS, Black men are 8.6 times more likely than White men to have AIDS, and Black women's AIDS rates are 18.6 times higher than White women (U.S. Department of Health and Human Services [USDHHS], 2019).

From 2015 through 2019, Black gay and bisexual men aged 25-34 and 55 and older showed a 6% increase in HIV Infection rates (CDC, 2019; see Figure 1). According to the CDC (2019) in the same year, age groups 35-44 and 45 to 54 decreased by 15%

and 24%, respectively. HIV infection rates for gay and bisexual men aged 35-44 remained stable (CDC, 2019). The population diagnoses of HIV infection remained higher for Blacks than all other racial-ethnic groups (CDC, 2020). From the beginning of the HIV epidemic to 2018, approximately 290,000 Blacks had died from Stage 3 HIV infections, with 6,678 deaths reported in 2018 (CDC, 2020). Further, Black, gay, and bisexual men aged 13 to 34 accounted for 26% (3 out of every 4) of HIV infection diagnoses (CDC, 2020a). Young Black adolescents who have sex with men (YMSM) have been researched and have an increased risk for HIV infections and worse health outcomes than heterosexual adolescents (Herrick et al., 2014). Young Black men are highly vulnerable to HIV infection due to a lack of knowledge of their HIV status, failure to get tested, the belief HIV treatment limits their risk, and underestimating personal risk factors for HIV infection (CDC, 2021).

**Figure 1**

*New HIV Diagnoses Among Gay and Bisexual Men in the United States and Dependent Areas by Age and Race/Ethnicity in 2019*




*Note*. Reproduced from CDC. Diagnoses of HIV infection in the United States and dependent areas, 2019. *HIV Surveillance Report*, 2021, p. 32. https://www.cdc.gov/hiv/statistics/overview/ataglance.html

In the United States, HIV infection, AIDS, and mortality rates in women are also a concern (Holder et al., 2009). Heterosexual Black women's most significant risk factors involve the high-risk behaviors of their male partners and the failure of men to disclose their same-sex partners (Paxton et al., 2013). For Black women, the risk for HIV infection is mainly through their partner's behaviors and is less about their individual behaviors (Oser et al., 2017). Factors such as lack of condom use, relationship violence, low SES, and the need for financial assistance from men were reported as factors in acquiring HIV infection (Holder et al., 2009).

The issue of MSMW and high-risk sex behaviors are essential to women and children who are especially vulnerable to contracting STDs and are at an increased risk for adverse health outcomes (CDC, 2018). In the United States, high HIV infection rates among MSM who also have sex with women have contributed to high incidence rates among MSMWs (Dyer et al., 2017). The risk factors of female partners of MSMW relative to their individual risks and the risks of their male partners (Oster et al., 2017). Epidemiological research has suggested MSMW is a bridge population to women and emphasizes why high-risk behaviors and STDs should be examined in terms of how these risk factors are related to female partners (Dyer et al., 2017).

**Epidemiology of HIV/AIDS**

HIV/AIDS is characterized by three diagnosis categories, including a diagnosis of HIV infection (not AIDS), a diagnosis of HIV infection with subsequent AIDS diagnosis, and a concurrent diagnosis of HIV infection and AIDS (Johnson et al., 2010). Five transmission categories define HIV infection transmission routes and include male-to-

male sexual contact among MSM, injection-drug use, and both MSM and injection-drug use (Johnson et al., 2010; see Table 1). But it is undetermined whether heterosexual HIV infections are a result of having sex with MSM or if it is a result of having sex with an intravenous drug user (Raymond et al., 2017). High-risk heterosexual transmission exposures include engaging in heterosexual intercourse with a partner who is HIV positive, a partner who is an intravenous drug user, and a partner who has sex with men (Raymond et al., 2017).

**Table 1**

*New HIV Diagnoses Among Adults and Adolescents in the U.S. and Dependent Areas by Transmission Category, 2020*

| Transmission category | Males | Females | Total |
|---|---|---|---|
| Male-to-male sexual contact | 20,758 | N/A | 20,758 |
| Injection drug use | 1,198 | 857 | 2,055 |
| Male-to-male sexual contact and injection drug use | 1,109 | N/A | 1,109 |
| Heterosexual contact | 2,051 | 4,575 | 6,626 |
| Perinatal | 9 | 51 | 60 |
| Other | 20 | 7 | 27 |

*Note.* Adapted from CDC. Diagnoses of HIV infection in the United States and dependent areas, 2020. *HIV Surveillance Report,* 2022, p. 33. https://www.cdc.gov/hiv/statistics/overview/in-us/diagnoses.html

Since the onset of HIV infection in the United States, there have been noticeable inconsistencies related to how HIV infection is transmitted (Moore, 2011). Transmission modes for HIV infection were initially thought to be only through anal intercourse and only affected men residing in large cities on the East and West coast (Moore, 2011). But HIV infection transmission is associated with other risk behaviors related to exchanging body fluids, considered the most significant HIV infection route (CDC, 2022). With the development of improved clinical testing and epidemiology, it was later discovered

transmission of HIV infection was not only transmitted through anal sex but through vaginal sex and infected blood products (transfusions; Moore, 2011). Additional routes include oral sex, "mouth on penis, mouth on vagina or anus"; however, HIV infection is rarely transmitted through oral sex (CDC, 2019). Transmission fluids include semen (cum), pre-seminal, vaginal, rectal, and breast milk (CDC, 2022). Further, HIV-infected women can transmit HIV infection to their unborn fetuses (Moore, 2011).

In the United States, the transmission of HIV infection is through many high-risk routes (CDC, 2019). Having unprotective receptive anal intercourse (RAI) poses a higher risk for HIV infection due to the increased risk of tears in the anus allowing entry into the bloodstream during sexual intercourse through the lining of the anus (CDC, 2014; Dangerfield et al., 2017; Edwards & Carne, 1998; Vietinghoff et al., 1999). The risk of contracting HIV infection increases with STDs, including gonorrhea, chlamydia, syphilis, trichomoniasis, human papillomavirus (HPV), genital herpes, and hepatitis (CDC, 2019).

In addition to elevated risk for HIV infection, there is an increased risk of transmitting ulcerative STDs, including syphilis and herpes simplex type 2, which increases the likelihood of spreading HIV infection (Dangerfield et al., 2017). Women are more susceptible to the vaginal transmission of HIV infection due to the mucous membranes in their vagina and cervix (CDC, 2019). Men can also acquire HIV infection from women through vaginal fluid, which enters the penis opening or through abrasions in their penis (CDC, 2019). High-risk behaviors for contracting and transmitting HIV infection and other STDs include alcohol consumption and drug use, which affects individuals' judgment related to the type of sex engaged in and the type of partner(s) they

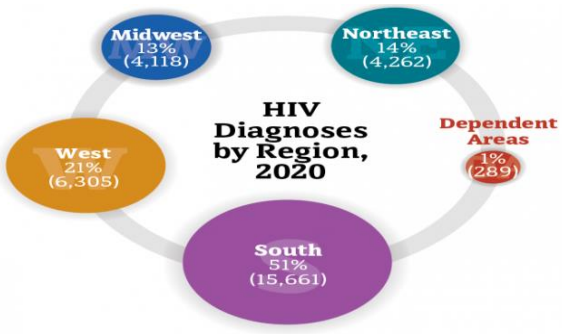
engage in sex with (CDC, 2019).

## Problem Statement

A marker for HIV transmission is evaluated in terms of new diagnoses of HIV infection (Johnson et al., 2010). In populations of 500,00 or more, HIV infection is considered an urban disease (CDC, 2021). The South reported the highest number of HIV infections, with the Northeast having the highest rates of HIV infection (CDC, 2021; see Figure 2).

**Figure 2**

*2020 HIV Diagnoses in the United States by Region*




*Note*. Reproduced from "HIV in the United States by Region: HIV Diagnoses," by CDC, 2021, p. 32. https://www.cdc.gov/hiv/statistics/overview/diagnoses.html

By the end of 2019, approximately 1.2 million people had an HIV-positive serostatus. As a result of the high HIV rates, there have been over 700,000 deaths since the first diagnosis in 1981 (Fauci et al., 2019). Of this number, approximately 754,700 were reported in gay and bisexual populations (CDC, 2022). In 2019, the Black population represented 482,900 (6 in 7) HIV diagnoses, with 87% aware of their HIV status (CDC,

2021). In the United States, 23% of new cases were transmitted by individuals not knowing their HIV status (Fauci et al., 2019). Consequently, 69% of these new HIV infection cases are transmitted by HIV-infected individuals not receiving treatment (Fauci et al., 2019).

The persistent disparities in HIV infection are distinguishable based on race/ethnicity, gender, sexual orientation, identity, and location (Hickson et al., 2015). Specifically, factors identified as having epidemic rates of HIV infection include women, low SES individuals, and communities of color (German et al., 2015). Of central concern is the high prevalence of HIV infection in sub-groups of MSM (Dyer, 2014). The two high-risk populations of MSM and MSMW are disproportionately affected by higher HIV infection rates (Dyer, 2014; Parker et al., 2018).

Further, the high prevalence of HIV infection in populations of Black MSM and other races/ethnicities of MSM has increased the risk for HIV infection (CDC, 2021). Black men in the United States aged 18-40 continue to have higher rates of HIV infection and other STDs (CDC, 2020). Specifically, the Black MSM age group 12-29 has the highest concentration of HIV infection (Dacus & Sandfort, 2020). But more research is needed to determine how HIV-negative Black MSM can remain negative (Dacus & Sandfort, 2020).

Research has identified risks for HIV infection and other viral infections associated with MSM's social-sexual networks and increased numbers of sexual partners exposures (Goldstein et al., 2015). MSM collectively share numerous membership attributes related to beliefs and behaviors and have a similar risk for HIV infection

(Amirkhanian, 2014). HIV infection and STDs are acquired and transmitted through a sexual partner in the networks' constructs (Ledesma et al., 2015). Equally crucial to high-risk transmission rates for HIV infection are sexual networks, including overlapping sexual relationships with more than one person (Kalichman & Grebler, 2010; Tieu et al., 2015). Having unprotected anal intercourse is a significant risk factor for HIV infection and STDs in MSM (Benson et al., 2019). In addition, behavioral sexual risks and intravenous drug use can facilitate HIV transmission among individual members in these networks (Baral et al., 2013).

Research indicates a relationship between MSMWs and a wide range of social networks having an increased probability of spreading HIV infection throughout other sub-populations and communities (Friedman et al., 2014). Bridgers are individuals who spread infectious diseases from one sub-population to another and center around the individuals' position within the networks (Youm et al., 2009). The primary transmission route for HIV infection is through sexual contact with MSM, representing an increased secondary HIV transmission risk for Black women through heterosexual sex (Friedman et al., 2014; Sales & Sheth, 2018).

Research has identified this secondary transmission risk as a plausible "bisexual bridge" (Malebranche et al., 2010). The bisexual transmission bridge suggests heterosexual women are at increased risk for contracting HIV infection by having sex with MSM who fail to disclose their actual sexual orientation (Malebranche et al., 2010). But research conducted on HIV transmission has overlooked bridges among individual sub-populations (Youm et al., 2009).

Although there have been decades of research on the HIV epidemic, there has been inconclusive data to explain why gay, bisexual, MSM, and young Black adolescents continue to inverse the number of diagnoses of new HIV infection (CDC, 2020). Behavioral studies conducted on MSM and transmission risk for HIV infection have failed to adequately explain disparities in the incidence and prevalence of HIV infection in Black MSM (Rosenberg et al., 2014). Much of the research on risk factors associated with HIV infection has focused on MSMO; however, there has been insufficient research on MSMW (Dyer et al., 2015). Much debate still exists regarding identifying differences between subgroups of Black MSM (Wilson & Miyashita, 2016).

Few studies examine the relationship between self-reported sexual identity and behavioral factors, including sexual positioning risks, partner-level risks, and sex behavioral risks (Alexander et al., 2015). No standard exists to provide measurements or assessments related to sexual positioning identity, preferences, or behaviors associated with anal sex among MSM and MSMW (Dangerfield et al., 2017). Research has also not explained sexual positioning behavioral risks in heterosexual women, presenting a gap in the literature for this population (Benson et al., 2019). To gain a more in-depth understanding of how risk factors impact possible bridging behaviors in MSM transmission of HIV infection to heterosexual females, research needs to be conducted (Raymond et al., 2017).

## Purpose of the Study

This study aimed to determine whether relationships exist between self-reported sex identity and sexual behavioral risks in Black MSM aged 18-40 in three diverse U.S.

cities: Los Angeles, CA, Chicago, IL, and Raleigh-Durham, NC. In addition, this study was conducted to expand on existing literature and gain a more in-depth understanding of the acquisition and transmission of HIV infection risks in two high-risk populations Recent studies have contradicted early studies showing a diverse sample of MSM's and MSMW's versatility related as being "topped" (18%-35%) and "bottomed" (23-42%) and reported versatility ranging from 42-47% among 12% of MSM (Dangerfield et al., 2016). This study followed a quantitative cross-sectional approach with secondary data to address the identified gaps in the literature. Statistical analysis was performed on secondary data and to determine if any statistically significant relationships existed between predictor variables self-reported sexual identity and outcomes variables related to sexual behavioral risks for HIV infection in the Black MSM and their female partners.

## Research Questions and Hypotheses

Research Question 1: What is the relationship between sexual identity and sexual behavioral risks among Black MSM?

$H_0$1: There is no significant relationship between sexual identity and sexual behavioral risks among Black MSM.

$H_a$1: There is a significant relationship between sexual identity and sexual behavioral risks among Black MSM.

Research Question 2: What is the relationship between sexual identity, female partner type, and sexual behavioral risks?

$H_0$2: There is no significant relationship between sexual identity, female partner type, and sexual behavioral risks.

$H_a$2: There is a significant relationship between sexual identity, female partner type, and sexual behavioral risks.

Research Question 3: What is the relationship between sexual identity, female partner types, and sexual orientation disclosure?

$H_0$3: There is no significant relationship between sexual identity, female partner type, and sexual orientation disclosure.

$H_a$3: There is a significant relationship between sexual identification, female partner type, and sexual orientation disclosure.

Research Question 4: What is the relationship between sexual identity and sexual behaviors among Black MSM?

$H_0$4: There is no significant relationship between sexual identity and sexual behaviors among Black MSM.

$H_a$4: There is a significant relationship between sexual identity and sexual behaviors among Black MSM.

## Theoretical Foundation for the Study

To address gaps in research related to sexual behaviors, this study was guided by the BBT (Malebranche et al., 2010). This theory suggests the lack of disclosure of men's actual sexual orientation in MSM places men and women at an increased risk for

acquiring and transmitting HIV infection based on their behavioral sex risks with men (Malebranche et al., 2010). These behavioral bisexual risks may be considered a probable transmission vector for HIV infection transmission from MSMW to women who have sex with men (WSM; O'Leary & Jones, 2006).

The BBT has been used in research to bring together the role Black bisexual men may play in the "bridging" of the HIV epidemics in the Black men and the Black women's population (Malebranche et al., 2010). It is imperative to establish how risk and protective factors for HIV infection and transmission vary between sexual identity as heterosexual/straight but also having sex with both men and women, which is also critical to prevention efforts (Rutledge et al., 2018). Research has identified numerous theories related to HIV infection transmission and acquisition risks.

However, there have not been any distinct theoretical models identified which relate to sexual risk behaviors in bisexual men (Malebranche et al., 2010). Janis and Mann's (1977) BBT originated from the decision-making model (Malebranche et al., 2010), which focused on distinguishing the relational factors affecting how individuals' choices when faced with "decisional conflict" in "consequential situations" (Semmel, 1979). The decisions made center on what individuals have to gain by their choices and define consequential situations (Semmel, 1979).

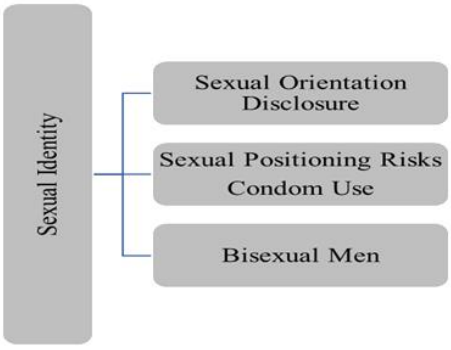
This model provides a theoretical basis for decisions about sexual orientation disclosure and sexual behaviors (Malebranche et al., 2010). However, it does not consider Black bisexual men's decision-making is more complicated (Malebranche et al., 2010). Much of the available research on BBT centers around a considerable debate on the

methods used to obtain samples and the belief all bisexual men live secretive lives (Malebranche et al., 2010). Research using BBT implies Black MSMW significantly affects the HIV epidemic due to the higher sexual risk contacts in their sexual networks (O'Leary & Jones, 2006).

The BBT framework is significant to this study because it suggests Black MSM who failed to disclose their same-sex attraction to their male or female partners results in high-risk behavioral sex (O'Leary & Jones, 2006). For this study, the BBT identified an applicable foundation and framework for same-sex behavior, sexual behaviors, condom use with male or female partners, and other relationships (partners/partner level risks; Malebranche et al., 2010). There is a lack of knowledge of how this concept still influences Black bisexual men's sexual behaviors (Malebranche et al., 2010). Figure 3 represents the frameworks for high-risk sexual behaviors of MSM used in this study.

**Figure 3**

*Bisexual Bridge Theory of High-Risk Sexual Behaviors among MSM*




*Note.* Adapted from "Bisexual Men and Heterosexual Women: How Big Is the Bridge? How Can We Know?" by A. O'Leary & K. T. Jones, 2006, *Sexually Transmitted Diseases, 33*(10), p. 595

Consequently, the BBT concept may be used as background information in future research opportunities on sexual identification and behavioral sex risk for HIV infection in Black MSM and Black MSMW (Malebranche et al., 2010). In addition, the BBT was a framework that offered a comprehensive overview of decision-making and risk factors for HIV infection transmission and acquisition.

## Nature of the Study

This study followed a quantitative cross-sectional design using secondary population-based survey data from the Sexual Acquisition and Transmission of HIV Cooperative Agreement Program (SATHCAP) (Iguchi et al., 2009). In this study I examined relationships between self-reported sex identification and sexual behavioral risks among Black MSM aged 18-40 residing in three diverse U.S. cities: Los Angeles, CA, Chicago, IL, and Raleigh-Durham, NC. I conducted a secondary analysis of existing data from the SATHCAP, which contains 2 years of data related to high-risk groups of MSM and drug users and low-risk groups of non-drugs using partners (Iguchi et al., 2009). The SATHCAP cross sectional study used the respondent-driven sampling (RDS) method to survey MSM and their sex partners from November 2006 to August 2008, containing all the variables identified in this study to answer the research questions (Iguchi et al., 2009). The SATHCAP data also includes participant demographic and responses related to sexual identification, high-risk behavioral sex, sex behaviors, sexual orientation, and partner-level risks (Iguchi et al., 2009).

A quantitative design helped to analyze a subset of Black MSM using data

collected via questionnaire responses, compare the groups of men, and describe if relationships exist among the study variables (see Creswell, 2014). Quantitative research design and data analysis was more suitable for testing the study hypothesis due to producing evidence supporting or not supporting the hypothesis (Creswell, 2014). In addition, using a quantitative research design can also test and support theories identified in research used to investigate why certain phenomena are occurring in populations (Creswell, 2014).

## Literature Search Strategy

The initial literature review shows past studies primarily focused on understanding the down low phenomenon and bisexual behavioral risks as a transmission bridge for HIV infection and other STDs. This literature review was aimed to advance a more in-depth understanding of sexual identity and behavioral sex risk in Black men's behavioral groups. The search strategy used for this study identified relevant full-text articles, including research documents published between 2005 and 2023 from Science Direct, Google Scholar, Pro-Quest, PubMed, Medline, and Biomedical Central sources at the EBSCO host engine at Walden University Library. The research strategy used a combination of search keywords and phrases, including *Down Low*, *Behavioral Bisexual*, *Bisexual Transmission Bridge*, *Black Paradox*, *Black men who have sex with men (BMSM)*, *Black men who have sex with men*, and *women (BMSMW)*, *Men who have sex with men (MSM)*, *HIV*, *STD's*, *Sexual and Social Networks*, *Heterosexual anal intercourse*, *Sexual positioning*, and *High-risk sex behaviors*. The search produced numerous articles specific to Black MSM/W and produced numerous historical articles

which met the inclusion criteria, were published in English, were included, and further assessed using the title, abstract, and full text to determine study relevance and possible theories and concepts.

Based on the literature review, multiple theories presented numerous perspectives on the research. This study's literature review objective was to advance an in-depth understanding of sexual identity and behavioral sex risk in Black men's behavioral groups. The variables studied are sexual identity, sexual orientation disclosure, high-risk sex positioning behaviors, partner-level risk behaviors, and sexual behavioral risks for transmission of HIV infection. Selected articles related to this study and MSM behavioral risk factors for STDs and HIV infection will be described here.

## Literature Review Related to Key Concepts

### Sexual Identity/Orientation

There are four sexual identities associated with sexual behaviors: gay, bisexual, straight, and down low (Rutledge et al., 2018). Self-reporting is the standard method used in sexual identification; heterosexual/straight versus gay or homosexual (Goldstein et al., 2015). These behavioral groups of MSM were socially constructed to establish behaviors and not identify what places individuals at a higher risk for HIV infection (Young & Meyer, 2005). But public health research has evaluated the correlation between sexual identity and its effect on sexual behaviors (Baldwin et al., 2014).

Research combining sexual identity and behaviors has been complex due to not fully recognizing the relationship between identity and behaviors, which may present numerous contradictions (Everett, 2013). Individuals considered part of the sexual

minority feel discriminated against and do not readily identify with being labeled as homosexual but rather identify as gay, lesbian, transgender, or down low (Young & Meyer, 2005). As a result, Black men have difficulty identifying as gay or homosexual due to their same-sex behavior (Fields et al., 2001; Wright, 1993; Melebranche et al., 2009). Research on men considered sexual minorities up to this point has focused on the sexual disclosure of gay men and sexual identity disclosure, thus failing to distinguish between the two groups (Schrimshaw et al., 2016).

Further, Black bisexual men are inclined to evaluate the positives against the negatives of disclosing their same-sex behaviors and disclosing to their male partners, that they have sex with women (Malebranche et al., 2010). The stigma associated with the social construction of Black sexuality poses disease risks (Ford et al., 2007). As a result, in ethnic communities, there is an increased denial of sexual identity, especially in Black communities where being labeled as bisexual and gay is not readily accepted (Fullilove & Fullilove, 1999; Sandfort & Dodge, 2008; Ward, 2005).

Black communities associate Black men labeled as being gay as displaying feminine behaviors of women, which leads to difficulty acknowledging their actual orientation (Koenig, 2018; Malebranche et al., 2009). For Black men, masculinity is related to power, and Black men should not exhibit fear, feminine behaviors, or show any affection toward other men, which is consistent with long-established roles (del Pino et al., 2022; Hall & Applewhite, 2013; Ward, 2005). This devaluation of sexual identity causes individuals to feel humiliation and anxiety related to disclosing, which affects their social interactions and creates low self-esteem (Berger et al., 2001; Bunn et al.,

2007; Clum et al., 2009; Deacon, 2006).

MSM experience prejudice, shame, and biases, establishing societal circumstances, which increase their lack of practicing protective HIV infection behaviors (Crosby et al., 2016). Gender role conflicts, hypermasculinity, and internalized hemophobia have a harmful effect on risk behaviors and health care access (del Pino et al., 2022). This population of men is more likely to engage in behavioral sex risks, including having unprotected anal intercourse (UAI), failing to disclose to healthcare providers their sexual behaviors, and their inability to get tested for HIV infection (Crosby et al., 2016). Behavioral health outcomes related to shame significantly influence individuals and their risk behaviors, affecting how individuals adjust to their HIV infection status (Clum et al., 2009).

**Down Low Phenomenon**

Since the onset of the HIV epidemic, public health has also identified a phenomenon in Black men known as the Down Low identity, used as a secret code for Black MSMW (Pettaway et al., 2014). The phrase Down Low has created a significant public health concern about bisexuality in the ethnic male population and the connotations of a "secretive bisexuality" among Black men (Sandfort & Dodge, 2008). Since the introduction of the "Down Low" phenomenon, there has been difficulty in defining sexual orientation (Everett, 2013). Consequently, a new term, "sexual minority," is used to identify a unique population associated with sexual identity, behaviors, and same-sex attraction (Everett, 2013).

The Down Low phenomenon has been filled with complicated factors and has

become synonymous with a heterosexual man who engages in sex with men and is considered a more focused definition of the Down Low (Boykin, 2004; Sandfort & Dodge, 2008). According to Rutledge et al. (2018), on the Down Low explains a social group of Black men who value and respect masculinity. Men on the Down Low also exhibit disapproval of having or displaying characteristics related to homosexuality and generally are described as being abnormal (Rutledge et al., 2018).

Research conducted on the Down Low phenomenon identified five comparable descriptions, including MSM, Black men, not identifying as gay, having sex with both men and women, not disclosing their sexual behaviors to their male and female partners, and never or inconsistently using condoms with males and female partners (Wolitski et al., 2006). Relatively little is understood about the Down Low phenomenon, as there has been substantial debate (Goparaju & Warren-Jeanpiere, 2012). Past research has not been able to support a relationship between high HIV infection rates and its relationship to Down Low men mainly due to the low numbers of men who identify with this phenomenon (Goparaju & Warren-Jeanpiere, 2012).

In addition, not a lot of research provides a perspective of men considered to be on the Down Low harm heterosexual Black women (Goparaju & Warren-Jeanpiere, 2012). This secretive Down Low lifestyle establishes a connection between MSMW and increased sexual risk, which places both men and unsuspecting women at increased risk for HIV infection (Dyer, 2014). According to Wilson and Miyashita (2016), clarifying the multiple subgroups of BMSM is the first step to identifying subgroup-specific factors affecting the HIV transmission bridge.

In research conducted in the U. S., the epidemiological group definition of Black MSM continues to represent the highest prevalence of HIV infection (Wilson & Miyashita, 2016). Research has identified numerous HIV infection behaviors related to intravenous drug use, concurrency, and concurrent sex partners of Black women and a relationship to high rates of HIV infection (Raj & Bowleg, 2012). Research conducted to investigate MSMW is limited and has misrepresented and disregarded MSM as a sub-group (Crosby et al., 2016). According to Crosby et al. (2016), much of the research on Black populations primarily focused on differentiating between MSMW and men who have sex with women only. Researchers have raised questions about multiple sexual identity categories and their effect on behavioral sex risks in MSM (Rutledge et al., 2018). Grouping men into bisexual categories versus homosexuals is critical in measuring sex behaviors and risk factors in MSM subgroups (Rutledge et al., 2018). As a result of these misrepresentations and multiple sexual identities, the categorical grouping of bisexuals and MSMW is still poorly understood (Rutledge et al., 2018). Although, to date, considerable research has been conducted on Black MSM as a "monolithic" category, research has failed to address the inconsistencies in sexual identity, failure to disclose identities, or sexual partners (Watson et al., 2018).

**Behavioral Bisexuals**

Research on labeling men as behavioral bisexuals describes them by their failure to identify as bisexual and failure to acknowledge their sexual orientation, preference, and/or identity (Sandfort & Dodge, 2008). Research has consistently used self-identified behavioral bisexuals to identify bisexual men (Schrimshaw et al., 2016). This

identification presents additional barriers to this population, who are less likely to disclose their identity than gay men (Schrimshaw et al., 2016).

Black MSM, compared to all other racial/ethnic groups of MSM, are labeled as being behavioral bisexuals; however, they do not identify as being gay, and they do not disclose their bisexuality or homosexual behaviors to others (Kennamer, Honnold, Bradford, & Hendricks, 2000; Millett, Malebranche, Mason, & Spikes, 2005; Harawa et al., 2008). This lack of disclosure creates a failure to differentiate between bisexual identity and bisexual behaviors, leading to high-risk sex behaviors with both men and women (Malebranche et al., 2010).

Behaviorally bisexual men who fail to disclose their sexual orientation have been associated with mental health issues, internalized homophobia, and a higher probability of unprotected vaginal sex (Schrimshaw et al., 2016). Black MSM frequently engages in behavioral bisexual sex with women and have been associated with a higher likelihood of identifying as bisexual or behavioral bisexuals than other racial/ethnic groups of men (Allen et al., 2015). Consequently, as implied in social constructs, sexualities (like other social groupings) are the results of a social system sex patterns. These social system variable distinctions based on sexuality and may not be able to be categorized due to differences in sexual identity based on history and cultural background. Researchers have determined a need to examine sexual identity and sexual behaviors to understand better STD disparities in populations based on sexual orientation (Everett, 2013). According to Rutledge et al. (2018), it is crucial when evaluating "between-group" risk behaviors for diseases among bisexual and homosexual men; it requires consideration of the within-

group group differences between these two sexual identities.

**Bisexual Bridge Theory**

Accumulating research indicates men who have sex with men and women (MSMW) are a significant "virus-related" bridge for HIV infection and other STDs in heterosexual populations (Friedman et al., 2014). Research suggests MSMW is a primary factor in the spread of HIV infection and STDs (Friedman, 2014). The BBT establishes a relationship between two groups, sexual identity; orientation disclosure; condom use, and bisexual men (Dodge et al., 2008; Ford et al., 2006; King, 2004; Millett et al., 2005). The BBT suggests bisexual men who secretively have sex with men place heterosexual women at a higher risk for HIV infection because of their Down Low identity (Malebranche et al., 2010).

Research conducted on sexually active bisexual men as a possible bridge; thus, it is likely another category of HIV infection transmission is associated with MSM transfer to women who have sex with men (WSM) (O'Leary & Jones, 2006). Bridging in the U.S. has primarily focused on Black men on the "Down Low" and MSMW as a bisexual bridge to HIV infection in Black women (Rothenberg, 2009). An additional significant factor in the HIV infection transmission bridge for Black heterosexual women is the risk behaviors of sexual partners of MSM who also identify as heterosexual (Paxton et al., 2013). The population of MSMW supports the argument, a transmission bridge exists and is associated with their secretive lifestyle known as the Down Low or being a behavioral bisexual (O'Leary & Jones, 2006).

**Bridge Populations**

Past research has identified high and low-prevalence bridge populations as having a significant role in transmitting HIV infection (Youm et al., 2009). Most descriptions of populations related to bridging have been evaluated based on individual locations, behaviors, and risk networks (Shah, 2014). Research investigating the networks of MSM has associated them with two high-risk groups of individuals, super propagators (transmitters) and drug users, who are also connected with high transmission rates of STDs (Youm et al., 2009).

The two differing sexual mixing patterns imply a bridge between sexual networks interrelated with individual characteristics (Gorbach, 2009). These networks include comparable factors, geographic location, age, ethnicity, and levels of sexual activity. Black MSM is "homophilous" in their sexual partnerships, creating a transmission bridge due to the high possibility of having sex with a partner who is HIV positive (Amirkhanian, 2014). Sex risks for HIV infection and STDs related to behaviors through unprotected anal sex differ based on sexual positioning and are more likely to spread diseases (Dangerfield et al., 2018).

According to Shah (2014), behavioral science research has primarily concentrated on the effects of social norms, thus failing to examine the importance of individual positions within the network or bridge and how it impacts HIV transmission. The examination of the Down Low phenomenon embodies a perspective, that it has adversely affected heterosexual Black women (Goparaju & Warren-Jeanpiere, 2012). The phenomenon explored the likelihood, that Down Low could be significant to HIV

infection transmission route in women (Goparaju & Warren-Jeanpiere, 2012).

The Down Low phenomenon focuses on the bisexual bridge theory, emphasizing sexual orientation is the leading cause of HIV infection in women (Millett et al., 2005; Malebranche et al., 2010; Goparaju & Warren-Jeanpiere, 2012). As a result of this theory, sexual orientation cannot be attributed to a lack of condom use with sex partners regardless of orientation or lack of serostatus (Goparaju & Warren-Jeanpiere, 2012). Bridge populations are considered a significant factor in the transmission of HIV infection related to sub-groups or networks and due to interactions, which ordinarily would not be associated (Youm et al., 2009).

There is limited research conducted on bridges in different sub-populations based on depictions of "Person A," who has a higher likelihood of becoming infected than "Person B" (Youm et al., 2009). Person B would be considered a significant propagator in spreading STDs if he or she engaged in sex with individuals from different subpopulations (Youm et al., 2009). Consequently, spreading disease to different sub-population groups would not be possible without the "Person B" bridger being infected (Youm et al., 2009).

**High-Risk Sexual Positioning Behaviors**

Sexual positioning behaviors include men who engage in unprotected receptive anal intercourse (RAI) and men who engage in unprotective insertive anal intercourse (IAI) or both with different partners (Dangerfield et al., 2017). Sexual positioning and versatility are based on numerous circumstances related to the sexual encounter and affect innumerable factors related to age, partner type, masculinity labels, body size,

penis size, and femininity used as power to depict MSM (Dangerfield et al., 2018).

Existing research has indicated differences in anal sex positioning based on demographic characteristics (Dangerfield et al., 2017). Sexual positioning is gender-related, with MSM identifying a woman's role with men and participating in having receptive sex (Dangerfield et al., 2018; Dworkin et al., 2017; Hoppe, 2011; Johns et al., 2012). Among MSM, sexual positioning defines their sexual identity as heterosexual, with "top" and "bottom" representing the gay level, in which the man perceives himself. Being a "top" signifies being masculine or heterosexual (straight), and a "bottom" is representative of being feminine (gay) (Dangerfield et al., 2017; Johns et al., 2012).

Black MSM who engage in insertive anal or oral sex is consistent with heterosexual insertive (penis) sex, and they believe that having insertive sex with a man keeps their manhood intact (Melebranche et al., 2009). Sexual positioning of Black MSM who identify as "tops" are described as being "masculine" (Dangerfield et al., 2018; Dworkin et al., 2017; Hoppe, 2011; Johns et al., 2012). Being "tops" with MSM's Black sexual partners has been perceived as being sexually aggressive, hyper-masculine, and are expected to be "tops" (Dangerfield et al., 2018; Dworkin et al., 2017; Hoppe, 2011; Johns et al., 2012).

According to Dangerfield et al. (2018), studies have consistently found Black MSM, like other MSM groups, prefer masculine partners and the perception of a masculine partner is more powerful and less likely to be HIV-positive. In addition, some MSM who engage in receptive sex are more willing to accept the risk associated with having unprotected sex and give up their right to negotiate condom use to men who are

"tops" (Dangerfield et al., 2018; Dworkin et al., 2017; Hoppe, 2011; Johns et al., 2012). The practice of "bottom" receptive and "top" insertive positions increases the acquisition and transmission risk for HIV infection and STDs in male and female partners (White & Stephenson, 2014). Recent evidence suggests serodiscordant men who engage in unprotected anal intercourse will most generally be the receptive partner of an HIV-negative partner (White & Stephenson, 2014).

According to White and Stephenson (2014), behavioral risks related to condomless sex vary by sexual positioning. High-risk positioning behaviors related to receptive anal intercourse and sex without a condom place MSM at a higher risk for HIV infection (Goldstein et al., 2015). Newcomb and Mustanski (2013) conducted a study investigating age and race and the relationship to characteristics of sexual partnership and risks using the diaries of one hundred forty-three Black MSM. The study indicated Black MSM have fewer sexual encounters with women while having more receptive anal intercourse with men than other identities (Newcomb & Mustanski, 2013).

The study found no significant differences by identity in the number of condomless insertive anal intercourse with men and reported gay men as having considerably higher condomless receptive anal intercourse (Newcomb & Mustanski, 2013). Newcomb and Mustanski's (2013) findings noted differences in condomless anal intercourse among men. Significant differences were reported based on identity for condomless vaginal and anal intercourse with women (Newcomb & Mustanski, 2013). Newcomb and Mustanski (2013) study noted a crucial need to explore differences in sexual behaviors in Black MSM based on sexual identity.

In the U.S., a significant factor in the current HIV epidemic is heterosexual transmission (German et al., 2015). To date, little attention has been given to HIV prevention, which focuses on heterosexual communities (German et al., 2015). Research conducted has implied anal sex occurs in many heterosexual couples, which is considered a significant transmission route for HIV infection and other STDs (Stahlman et al., 2015). In a review of research on anal intercourse (A.I.), a substantial proportion of heterosexual women report participating in A.I. throughout their lifetime (Stahlman et al., 2015). As a result, among heterosexuals, A.I. is often overlooked as a risk factor for HIV infection (Stahlman et al., 2015).

According to German et al. (2015), the use of condoms is less for anal sex than for vaginal sex in heterosexuals than in MSM. Research conducted by Stahlman et al. (2015) established a link between women engaging in anal intercourse and drug use. In addition, the research identified many sex partners, sex for money and drugs, and unprotected sex. In addition, HIV infection was also related to condomless anal sex (Stahlman et al., 2015).

Numerous studies fail to evaluate rectal STDs, and consequently, there is limited data on the circumstances concerning unprotected A.I. and its risk for STDs (Stahlman et al., 2015). According to Newcomb and Mustanski (2013), few studies have investigated the relationships and factors involving women participating in A.I. and unprotected. Additionally, there has been limited research on heterosexual condomless anal intercourse and transmission of HIV infection and other STDs (German et al., 2015).

**Social-Sexual Networks**

Epidemiological research on HIV infection rates among Black MSM has not been able to explain or understand the role of sex networks (DeMarc et al., 2017). Research has associated sexual networks with high HIV infection rates based on individual and partner-level risk behaviors within the sex networks (Tieu et al., 2016). The sexual element in networks establishes the sexual relationship whereby the connection between individuals forms the social network (Amirkhanian, 2014).

Both sexual and social network levels of risk include biological (HIV infection prevalence) and behavioral (sexual risks, intravenous drugs), which can accelerate HIV transmission among individual members in a network (Baral et al., 2013). Factors influencing the frequency of sexual encounters suggest the length of the partnerships and include serial and concurrent partnerships (Ludema et al., 2015). According to (Ludema et al., 2015), these factors are significant individual risk factors for increasing HIV infection and transmission throughout populations (Ludema et al., 2015).

There is also a lack of understanding of social network's role in the epidemiology of HIV infection among Black MSM (DeMarc et al., 2017). Network density is defined as "the extent to which network members have sex with one another," and concurrency is "sex with a partner that takes place between two sex acts with another partner" (DeMarc et al., 2017). The increased HIV infection rates in heterosexual men and MSM has been associated with the overlap of social and sexual networks (DeMarc et al., 2017). Black MSM's high-risk sex networks place them at increased susceptibility to HIV infection based on race, and these networks are considered social support "channel-specific" for

HIV-positive individuals (Amirkhanian, 2014).

**Partner Types**

Research consensus is disparities related to Black and White HIV infection rates go beyond individual risk behaviors and are associated with healthcare access and sexual networks (Sullivan et al., 2015). The types of sexual partners, variations in age (usually older), and race/ethnicity have been recognized as significant reasons for higher HIV rates in MSM (Berry, Raymond, & McFarland, 2007; Boyer et al, 2016; Feldman, 2010; Millett et al., 2007; Millett et al. 2006). Research has reported a substantial number (one to two-thirds) of Black MSM's HIV infection transmission occurs by risks among main partners, thus renewing interest in the main partners' role with a high prevalence of HIV infection (White, 2017).

Research has described Black MSM as having a preference for same race partners and are known for having joint partners, thus increasing their risk of HIV infection. (Amirkhanian, 2014). In populations of MSMW, partners also tend to be Black and older; most are of low SES and are more likely to be unemployed and homeless (Allen et al., 2015). According to DeMarc et al. (2017), there could be a significant link with network structure whereby Black MSM prefer partners of the same/ethnicity and older partners identified in Research as the populations with the highest prevalence of HIV infection.

Interpretations of Black men's masculinity, sexuality, and access to care are additional susceptibility factors to acquiring and transmitting HIV infection based on social and environmental influences (Wilson & Moore, 2009). Past and current research has reported significant disparities in HIV infection rates between Black MSM and White

MSM (Goodreau et al., 2017; Watson et al., 2018). In Black MSM populations, similarities in groups and sexual behaviors related to having unprotected anal sex and the types of partners chosen in the networks have been studied as influences that increase risks (Tieu et al., 2015).

Consequently, research has been inconclusive regarding whether race could explain these disparities (Goodreau et al., 2017; Watson et al., 2018). Research has also identified numerous vulnerabilities but has not been able to identify the exact causes of disproportionate HIV infection rates in Black MSM (Shah et al., 2014). These risk vulnerabilities include a higher prevalence of undiagnosed HIV infection, a lack of knowledge of a partner's HIV status, increased stigma, and minority stress events among Black MSM of low SES. (Shah et al., 2014).

In addition, to the risk vulnerabilities, there has been a lack of research on networks and their effect on HIV transmission among Black MSM (Shah et al., 2014). Studies have found Black men and White men had similar rates of having unprotected anal sex; however, Black men were less likely to know the HIV serostatus (Tieu et al., 2015). Yang et al. (2018) researched sexual risk behavioral outcomes reported as condomless anal intercourse (CLAI) with HIV-discordant or unknown HIV-status partners.

The multisite study baseline data from Latino and African American Men's Project was collected from four U.S. sites Baltimore, Chicago, greater Milwaukee /greater Detroit region, and New York City from 2008 to 2009 (Yang et al., 2018). The study recruited Black or African American participants who were at least 18 years of age,

with 73 participants reporting one sex event, 698 participants reporting two sex events, with 36 participants reporting three sex events (Yang et al., 2018). The study variables included individual sociodemographic and behavioral covariates, including heterosexual/straight, bisexual, queer, homosexual, or gay, not sure or other (Yang et al., 2018).

Additional variables included men who reported having at least two sexual partners in the past three months, had CLAI with one male, and consented to take an HIV test (Yang et al., 2018). The study results observed that CLAI with an HIV-discordant or unknown HIV status partner was associated with specific sex events level factors in Black MSM who were HIV negative, HIV positive, or unknown HIV status (Yang et al., 2018). Yang et al. (2018) findings indicated high prevalence rates of HIV infection in Black MSM could be attributed to multiple sex risk interactions in a sex act and not to person-level risk behaviors. The study also reported limitations with using data from urban cities in the Northeast and Midwest and reported these results might not be able to be generalized to other locations (Yang et al., 2018). Another limitation was the study focuses on recent sex partners; the findings may not include all sexual behaviors (Yang et al., 2018).

According to Chittamuru et al. (2018). In HIV and other STDs infection reduction efforts, it is crucial to recognize influences related to having numerous sex partners who could present increased risks. Also important is recognizing partner characteristics related to power, dependence, and partner violence, which may interfere with a man's ability to discuss using condoms and to employ additional preventive measures, which also require

examination (White et al., 2017). Additionally, according to White et al. (2017), there is a need for future examination of the construction of partner types and factors related to partner characteristics and measures.

**Partner Level Risk**

Approximately 32%-68% of HIV infection transmission occurs in main or primary partners (Hong-Van et al., 2016). This transmission risk suggests multiple interactions increase the HIV infection risk, indicating the need to evaluate these partner interactions (Hong-Van et al., 2016). According to Denson, 2013 three themes related to sexual risk behaviors are condom use, sexually transmitted infections, and drug abuse.

Sexual behaviors are a significant risk factor for acquiring and transmitting STDs; however, these behaviors cannot be considered in terms of a "social vacuum" (Everett, 2013). Half of all Black MSM in the U.S. will be diagnosed with HIV infection despite decreased behavioral risk and having fewer partners than MSM of other racial/ethnic groups (Dangerfield et al., 2018). Sexual partnerships through networks could explain how HIV infection and STDs are transmitted (Adimora et al., 2014).

These partnerships focus on the extent of time these partners spend together and apart, the frequency of sexual intercourse with high-risk individuals, and population spread (Adimora et al., 2014). Research suggests having multiple partners reported having a higher prevalence of STDs than women and heterosexual men is a significant factor for increased transmission of HIV infection for gay, bisexual, and MSM (Chittamuru et al., 2018). Research on Black MSM sexual networks is reported as being considerably smaller than MSMO but are considered highly connected (Scott et al.,

2015).

According to Scott et al. (2015), these sexual networks may be responsible for fueling high HIV infections across Black MSM networks. Both social and sexual networks are associated with a high prevalence of HIV infection risk factors and position (individuals' power to act) in a sexual network (Tiu et al., 2015). The overlapping individual, sexual, and social networks in MSM have been examined in the research (Amirkhanian, 2014). These networks are considered to have an underlying role in efforts to understand and prevent the underlying forces related to HIV/STD transmission (Amirkhanian, 2014). According to Oster (2013), to better understand HIV infection transmission, Research must look beyond individual risks and examine sexual and social network dynamics.

Research conducted by Dangerfield et al. (2017) established a link between sex behaviors of MSM and MSMW and distinct types of partners "(e.g., causal, regular)." These partner types influence the number of sexual encounters with individuals. Causal partners, also known as "hook-ups," play an essential role in sexual behavior as a "top" or bottom" versus a regular (committed) partner (Dangerfield et al., 2017). In discussion, Dangerfield et al. (2017) argued the types of partners determine the emotional bond, with some partners considered regular partners having an intense emotional commitment; in contrast, causal partners have little to no emotional commitment.

White et al. (2017) conducted extensive research using data collected from 2011 through 2013 on 193 Black and White MSM residing in Atlanta, GA. The study variables included race and partnership attributes identified and grouped main or causal and risk

behaviors (White et al., 2017). According to White et al. (2017), differences between main and causal partners have raised ambiguities, confusion, and definitions require researching different partner characteristics to determine how partner types contribute to exposure differences. The study results revealed Black MSM are less likely to engage in condomless anal sex than White men with the partner they identify as main based on the classification of main and casual partners (White et al., 2017).

Drug use, unprotected sex with both men and women, and increased mixing with high/low-risk partners contribute to high-risk sexual networks and advanced HIV infection transmission risks (White et al., 2017). The study also provided a detailed explanation and insight into social mechanisms and distinct behaviors of MSM sexual partnerships (White et al., 2017). However, the research failed to adequately describe MSM's partners, presenting a need for further research and using "evidence-based" classifications and a detailed definition of how MSM classify their partners (White et al., 2017). One significant risk factor for HIV infection identified in research among heterosexual Black men and women is the concurrency of their partners (Adimora et al., 2014).

According to Ludema et al. (2015), having concurrent partners does not increase HIV infection in individuals with numerous consecutive partners. Additionally, an individual's partner who has concurrent partners poses a higher risk of acquiring HIV infection (Ludema et al., 2015). Several studies have investigated the association and prevalence of individuals involved in concurrent relationships; however, research related partner concurrency has not received much attention (Adimora et al., 2014). Nonetheless,

there are many unanswered questions on which factors distinguish Black MSM with numerous sex partners versus Black MSM who do not have multi-sex partners (Chittamuru et al., 2018).

## Definitions

*Behavioral bisexual* - an individual who, usually within a specific period, engages in sexual activity with male and female (and sometimes transgender) partners (Sandfort & Dodge, 2008).

*Bisexuality* - is used in various ways; we prefer it to denote emotional and sexual attraction and involvement with members of both sexes (Sandfort & Dodge, 2008).

*Bisexual Bridge Theory* - identifies a useful foundation and framework for same-sex behavior, sexual behaviors, condom use with male or female partners, and other relationships (partners/partner level risks) (Malebranche et al., 2010).

*Black Race* - people having origins in any of the black racial groups of Africa, including immigrants from the Caribbean and South and Latin America (CDC, 2020).

*Black men who have sex with men and women (BMSMW)* - do not identify as gay or disclose their bisexual activities to main female partners, also known as men "on the down-low" (Millett et al., 2005).

*Bridge populations* - identified as a significant factor in the transmission of HIV infection related to sub-groups or networks and due to interactions, that would ordinarily not be associated (Youm et al., 2009).

*CDC HIV Diagnoses Racial Ethnic Groups* - American Indian/Alaska Native, Asian, Black/African American, Hispanic/Latino, Native Hawaiian, and other Pacific

Islander, White, and multiracial people (CDC, 2021).

*CDC HIV 6 Diagnosis Transmission Categories* - male-to-male sexual contact, injection drug use, male-to-male sexual contact and injection drug use, heterosexual contact, mother-to-child (perinatal) transmission, and other (includes blood transfusions and unknown cause) (CDC, 2021).

*Down Low* - a "secretly" bi-sexual Black man: The term arose in African American vernacular to describe any "secretive" behavior. The Down Low suddenly characterized "secretive bisexuality" as exclusive to Black men. The term also refers to a related sexual identity (Sandfort & Dodge, 2008).

*HIV Diagnosis* - refers to the number of people who have received an HIV diagnosis during a year, regardless of when they acquired HIV. (Some people can live with HIV for years before they are diagnosed; others are diagnosed soon after acquiring HIV) (HIV.gov, 2021)

*HIV Incidence* - refers to the estimated number of new HIV infections during a specified period (such as a year), which differs from the number of people diagnosed with HIV during a given year. (HIV.gov, 2021)

*MSM* - behaviorally homosexual men (Rutledge et al., 2018).

*MSMW* - stands for men who have sex with both men and women, and it is used interchangeably with "behavioral bisexuality (Sandfort & Dodge, 2008).

*Sexual Behaviors* - a significant risk factor for acquiring and transmitting STDs (CDC, 2022)

*Sexual Concurrency* is "overlapping sexual partnerships where sexual intercourse

with one partner occurs between two acts of intercourse with another partner" (Rosenberg et al., 2012).

*Sexual Identity* - Behavior subgroups are defined as heterosexual but somewhat homosexual. There are four sexual identities related to sexual behaviors; gay, bisexual, straight, and down low (Everett, 2013); (Rutledge et al., 2018).

*Sexual Minority* is used to identify a unique population of individuals and is associated with sexual identity, behaviors, and same-sex attraction (Everett, 2013).

*Sexual Orientation* - self-identification in Black men is categorized in several ways; a person's enduring attraction to one sex or the other. Orientation can be hetero, homo, or bisexual (Everett, 2013).

*Sexual Positioning Behaviors* - are defined by the type of sex engaged in (e.g., receptive anal intercourse (RAI) or insertive anal intercourse (IAI) (Dangerfield et al., 2017).

*United States (U.S.)* - includes the 50 states, the District of Columbia, and the six dependent areas of American Samoa, Guam, the Northern Mariana Islands, Puerto Rico, the Republic of Palau, and the U.S. Virgin Islands (CDC, 2020).

## Assumptions

This study's assumptions include whether there is a representative sample of Black MSM and whether the participants answered the questions truthfully. Another assumption is the self-reported behaviors of the study participants were indicative of behaviors with their self-identified partners; the data collected followed ethical standards and caused no harm to the participants. Lastly, the data collection instrument, computer-

administered self-interviewing, accurately recorded the data and adequately measured the variables in the study.

## Study Limitations

There were a few limitations in this study. First, this study used secondary data; there was no input in developing the participants' questions for this study. The questions were designed to answer the SATHCAP study research questions, and not questions in this study. Secondly, this study involved Black men's sexual identity and behavioral sex risks, the participants self-reporting HIV status and stigmatized behaviors. As a result, responses related to sexual networks, partners, and type of intercourse may have led them to socially desirable responses (SDR) (Zerbe & Paulhus, 1987). SDR responses conform with acceptable social norms related to sexual practices and behaviors (Zerbe & Paulhus, 1987).

A third limitation is this study includes only Black participants from three U.S. cities. Based on this study, the sample may not represent the Black MSM population, and results may not be generalized to other populations of men or different geographical locations. Lastly, because the SATHCAP study was collected timeframe Phase I September 2005 - December and Phase II November 2006 and August 2008, there may be experiences and event recall issues based on partner types and sexual behaviors. Although this study listed several limitations, it presents numerous opportunities for further investigation and research.

## Scope and Delimitations

This cross-sectional study aimed to determine whether relationships exist between

self-reported sex identity and behavioral sex risks among Black men aged 18-40 residing in three diverse U.S. cities in Los Angeles, CA; Chicago, IL; Raleigh-Durham, NC. There are some delimitations of this study. One delimitation is the SAPTCH data was not collected to answer the specific questions in this study, and the target population for the study is Black men aged 18-40 residing in three diverse U.S. cities.

A second delimitation is the SATHCAP used respondent-driven sampling (RDS), which required participants to recruit partners and associates comparable to the participants who recruited them, which creates generalization issues to other populations of Black MSM. Lastly, this study will not address drug use by the participants recruited for the SATHCAP study. The SATHCAP, although historical data, contained all the variables needed to test this study's hypothesis.

## Significance, Summary, and Conclusions

In the 1980's public health identified an epidemiological category of men described as MSM. MSM are associated with behaviors as opposed to sexual identity or other constructs related to same-sex behaviors in men. In addition, in the 1990s, Black MSM was also identified by a negative label known as the Down Low. This population of Black men has been associated with a secretive lifestyle and fail to identify as being Gay or Bisexual and identify as being heterosexual.

Research has identified numerous factors, including sexual positioning behaviors, partner-level risks, and sexual and social factors, increased incidence and prevalence of HIV infection. Black MSM who also engage in sexual intercourse with women and who live a secretive lifestyle engage in anal intercourse and are less likely to use condoms

with their female partners. Research has not identified any theories which could be used to fully explain the high HIV infection rates in populations of Black MSM. Black MSM are considered "homophilous," which creates a transmission bridge by having a sexual relationship with an HIV partner.

In the U.S., bridging behaviors focused on bisexual men; however, MSM has been associated with HIV infection transmission to women having sex with these men. BBT has found women who have sex with Black MSMW (and/or men on the Down Low) are at increased risk of HIV infection. MSMW has been identified as a virus-related bridge for HIV infection and STDs in research in the heterosexual population of women. Sexual positioning behaviors include engaging in unprotected RAI and men who engage in IAI with both male and female partners and fueling HIV infection and STD transmission.

In spite of what would be expected, Black MSM's HIV incidence disparities continue despite engaging in preventive behaviors when compared to other populations of MSM (Hotton et al., 2018). These behaviors include with engaging in lower numbers of unprotected anal intercourse with a main or casual partner and not using drugs during sex (Hotton et al., 2018). Consequently, research has not been able to form a consensus on this paradox or why the high numbers of HIV infections continue with less risky behaviors related to having fewer partners throughout their lifetime.

This study will add to existing research and knowledge related to HIV infection rates in Black MSM and Black heterosexual women. In addition, understanding if relationships related to sexual identity and behaviors exist may have significant

implications in syndemic intervention prevention efforts in reducing the incidence of HIV infection in these two high-risk populations.

## Section 2: Research Design and Data Collection

This quantitative cross-sectional study was conducted to determine if relationships exist between sexual identification and behavioral sex risks among Black men aged 18-40 residing in three diverse U.S. cities: Los Angeles, CA, Chicago, IL, and Raleigh-Durham, NC. This second section discusses the research design, rationale sampling, methodology, study population, sample size, sampling procedures, target population, instrumentation, and statistical analysis plan. This section also discusses threats to validity and ethical procedures.

### Research Design and Rationale

This study followed a quantitative, cross-sectional research design to measure and segregate specific behaviors identified in the study framework (see Creswell, 2014). A cross-section design is simple and allowed the examination of the representative sample's secondary data variables of interest (Creswell, 2014). Cross-sectional designs provide larger populations and more versatility, there is no waiting for outcomes, and minimal follow-up is required (Creswell, 2014). Cross-sectional designs are better suited for secondary data analysis (Creswell, 2014). Using secondary data in this study also provided a snapshot of the population (Creswell, 2014).

Secondary data allows for an in-depth exploration of existing research data and ensures sensitive topics or hard-to-reach options are not over-researched (Creswell, 2014). In addition, existing data can be analyzed to generate new hypotheses or answer a

critical research question (Creswell, 2014). The review of using secondary data required four conditions: the data must be available if no secondary data exists, the primary data must be gathered, and the variables and identifying measurements for the study (Secondary Data, 2015).

Other considerations for using secondary data include the accuracy, the margin of error, the analysis method examined, and whether there is enough data to conduct research (Secondary Data, 2015). This study used secondary to determine if there are relationships between two variables and to identify new ideas in research (Secondary Data, 2015). Secondary data saved time and money and provided data from a large sample, leading to a higher-quality representative sample (Creswell, 2014).

## Methodology

A quantitative research design was used to quantify the variables used in this study and determine if relationships existed between sexual identity and behavioral sex risks in Black men aged 18-40 residing in three U.S. cities. This study used secondary quantitative data collected by the SATHCAP (Iguchi et al., 2009). The SATHCAP study was conducted in Los Angeles, Chicago, and Raleigh-Durham, (Iguchi et al., 2009). The SAPTCH study was conducted to advance knowledge of sexual and drug use behaviors associated with social and environmental influences. Data were collected in two phases. Phase 1 included U.S. sites September 2005 and December 2006), and Phase 2 was from November 2006 to August 2008.

Recruitment for this study was in two phases with minor differences in Phase 1 due to low recruitment of sex partners. Participants recruited in Phase I were not eligible

for recruitment in Phase II. RDS sampling was used in this study to recruit participants, and participants received financial incentives. RDS sampling allowed for the recruitment of a large number of drugs, non-drug users, and MSM assigned by stratification to eliminate bias. RDS used seed selection, and participants' partners were identified and randomly selected. The SATHCAP had use restrictions, and access to the data will be granted through the ICPSR member institution access process.

**Study Population**

The target population for this study was Black MSM aged 18-40 and was selected from the SATHCAP, a cross-sectional multisite study conducted in three U.S. cities: Los Angeles, CA, Chicago, IL, and Raleigh-Durham, NC (Iguchi et al., 2010). The SATHCAP yielded a total of 4,688 participants, 845 (18%) from the University of California, Los Angeles, University of Illinois, Chicago 2,739 (58.4%); and Research Triangle Institute 1,104 (23.5%). Participants in the SATHCAP were identified by self-reported race, with primarily Black/African American (73.1%), White (18.3%), American Indian/Alaska Native (2.1%), Asian, and Pacific Islander (0.71%). The participants were selected based on variations in sexual identity, orientation, drug usage, and race and ethnicity.

**Sample and Sampling Procedures**

This study's sampling was selected from the SATHCAP study frame and consisted of Black participants aged 18-40 (N = 3,426) residing in the three U.S. cities for this study (Iguchi et al., 2009). SATHCAP data are archived in the Inter-University Consortium for Political and Social Research (ICPSR 29181) and are available for

academic research and data analysis. Access to the data is restricted and requires permission.

**Sample Size and Population**

The SATHCAP, a cross-sectional multisite study, provided the sample of Black men who represented $N$ = 3,426 (73%) aged 18-40, and secondary data analysis was conducted on the sample (Iguchi et al., 2009). The sample estimated for this study to determine if relationships exist between sexual identity in sub-groups of Black men and sexual behavioral risks was calculated as $N$ = 190. This study calculated the estimate using a priori compute required sample size using a (0.05) power (0.80) and effect size. Sample size calculation used Test family, Z tests, logistics regression, and two-tails with a binomial X distribution. The G* Power sample calculation estimated a critical z = 1.9599640 and actual Power 0.8017292. Results of the actual power calculation showed that it could correctly reject the null if one of the independent (predictor) variable categories were not associated with the dependent (outcome) variables within the sample of the study participants.

**Survey Instrument**

The SATHCAP questionnaire design identified participants as bridges between high-risk to low-risk groups through the sexual transmission of HIV infection (Iguchi et al., 2009). The participants for the SATHCAP included MSM and drug users (DU) and men who were both MSM and DU (MSM/DU), and also included samples of sexual partners of MSM, DU. MSM/DU, and the sexual partners of sex partners (Iguchi et al., 2009). All participants read and signed consent forms.

Eligible participants completed three self-administered computerized interviews questions (Iguchi et al., 2009). Study respondents self-identified with their race, were aged 18 or older, reported having anal intercourse with a man in the past six months, and were required to undergo biological testing, including HIV (Iguchi et al., 2009). The study used selected seeds from well-connected network members of participants. Participants were recruited from three U.S. cities with sites and started with a small number of seeds. Seeds were expanded throughout the study to ensure adequate participants were recruited in one of the high-risk groups of MSM, drug user, and intravenous drug user.

The first question's primary purpose of the three questionnaires was to recruit individuals the participant knows who fit into each risk category. Participants who responded to the second or main were to determine drug use, sex behaviors, sexual partners, environment, and geographic and network factors related to risk factors (Iguchi et al., 2009). The third questionnaire responses to decrease response bias, assess the characteristics of individuals who declined coupons and were asked why they did not accept or redeem the coupons. All event-level questions were based on participant responses in the past 6 months.

**Instrumentation and Operationalization of Constructs**

The SATHCAP is a multisite cross-sectional study conducted by the National Institute on Drug Abuse (NIDA) (Iguchi et al., 2009). The survey included self-identified sexual identification, sexual orientation disclosure, sex behaviors, disclosure, high-risk sex behaviors, partner-level risk behaviors, and sexual partners questions. The

SATHCAP data will be used for secondary analysis and contains all the variables related to the study problem. Table 2 describes the measures this study used.

**Table 2**

*Data Source Questions for Operationalization of Independent and Dependent Measures*

| Variable | Description | Response Category | Type of Variable |
|---|---|---|---|
| Dependent Variables | | | |
| High Risk Sex Behaviors | Sex Risk Male (SRM)<br>1=Insertive anal sex (your penis in his anus "topped" you used a condom<br>2=Insertive anal sex (your penis in his anus "topped" you did not use a condom; you pulled out before you "came"<br>3=Receptive anal sex (your penis in his anus "bottomed" he used a condom<br>4=Receptive anal sex (your penis in his anus "bottomed" he did not use a condom; he pulled out before you "came" | 1=3 or more high-risk sex behaviors<br>0=< 3 high risk sex behaviors | Binomial |
| High Risk Sex Behaviors | Sex Risk Female (SRF)<br>1=Vaginal sex without a condom (he pulled out before he "came"<br>2=Vaginal sex without a condom (he "came" inside you<br>3=Anal sex without a condom -he pulled out before he "came" | 1=3 or more high-risk sex behaviors<br>0=< 3 high risk sex behaviors | Binomial |
| Do Female partners know you have sex with males? | Sexual orientation disclosure | 1=Yes<br>0=No | Binomial |

| | | | |
|---|---|---|---|
| Sex Behaviors | Describe your sex behaviors<br>1=I have sex with men only<br>2=I have sex with women only<br>3=I have sex with about equal numbers of men and women | 1= Bisexual behavior (code 2, and 3)<br>0=Sex with exclusive gender [men only (code=1) or women only (code 2)] | Binomial |
| Independent Variables | | | |
| Sexual Identification | Self-Reported SEX ID | 1=Gay or homosexual<br>2=Bisexual<br>3=Straight or heterosexual | Nominal |
| Female Sex Partner | Sex Partner Type | 4=Down low<br>1=Main Partner<br>2=Regular Partner<br>3=Friend<br>4=Acquaintance | Nominal |

| Variable | Description | Response Category | Type of Variable |
|---|---|---|---|
| Sociodemographic Variables | | | |
| Age in Years | Date of Birth | | Continuous |
| HIV Status Right Now | | 1=I am sure I am HIV negative<br>2=I may be HIV-positive<br>3=I am pretty sure I am HIV Positive<br>4=I have no idea what my HIV status is | Nominal |
| Highest Level of Education | Self-Reported | 1=No Formal School<br>2=High School Graduate (or GED<br>3=Graduated from 4year College/University<br>4=Graduate or professional Degree | Nominal |
| Marital Status | Self-Reported | 1=Single (never married)<br>2=Legally married/legal domestic partnership<br>3=partnered or informally married, living together<br>4=Separated | Nominal |

| | | | |
|---|---|---|---|
| Participant Location | Self-Reported | 1= Los Angeles, CA<br>2= Chicago, IL<br>3=Raleigh -Durham NC | Nominal |

*Note:* These questions were reprinted from the Sexual Acquisition and Transmission of HIV Cooperative Agreement Program, 2006-2008 (Iguchi et al, 2009).

**Description of Measures**

The questions used in this study have been identified in research and were designed to measure sexual behavioral risks and bridging behaviors in Black men. Participants for this study will use four self-identified sexual identity categories, Gay or homosexual, Bisexual, Straight or heterosexual, and Down Low (Iguchi et al., 2009). Additional measures for this study include sexual orientation disclosure and sexual behaviors with men and women in the past six months and specific behaviors related to sexual positioning and condom use (Iguchi et al., 2009).

For sexual partner data, participants responded to questions about behaviors with whom the participant had anal or vaginal sex in the past six months. Sexual partners were defined as primary regular or main partners of MSM (SRM) questions and (SRF) female partner type questions (Iguchi et al., 2009). For this study, partner-level sexual risk behaviors were identified as Sex Risk Males and Sex Risk Females (Iguchi et al., 2009). Sex behaviors and Risk variables include participants' self-reported behaviors within the past six months, condomless insertive and receptive anal intercourse with men, and condomless vaginal/anal intercourse with women, yes or no (Iguchi et al., 2009).

Sexual risk behaviors for contracting and transmitting HIV infection are defined as engaging in unprotected sex between a participant, a male partner, and/or a female partner within the last six months (Iguchi et al., 2009). Unprotected sex included vaginal

and/or anal intercourse with a woman or a man and involved the exchange of bodily fluids due to a lack of condom use (Iguchi et al., 2009). For this study, only three female partners, main, regular, and friend, were used in the statistical analysis. Participants responded to the disclosure to female partners of sexual identity questions (yes or no) (Iguchi et al., 2009). Sexual behaviors for this study consist of three categories; I have sex with men only; I have sex mostly with women; I have sex with about equal numbers of men and women (Iguchi et al., 2009).

**Appropriateness of Data Collection**

This study was designed to determine if relationships existed between two independent variables, sexual identity, and female partner types, and three dependent variables, behavioral sex risks, sexual identity disclosure to female partners, and sexual behaviors among Black men. This quantitative study included compiling statistical data to test the hypothesis. Participants responded to questionnaires related to background and sexual behavioral questions, including sexual partners and behaviors. The survey design for this study aligns with the self-administered questionnaires and the data collected. Data contains all the variables used in this study.

**Statistical Analysis Plan**

This study used quantitative methods to analyze the relationship between sexual identity and behavioral sex risk in Black men aged 18-40. This study analysis focused primarily on self-reported sexual identity, high-risk sexual behaviors, sexual orientation disclosure/female partner types, and sexual behaviors. This study analyzed the secondary data using IBM Statistical Package for Social Science (SPSS) Version 28 to test the

research hypotheses. This study used descriptive statistics and logistic regression to determine if there was a relationship between outcome variables behavioral sex risk condomless anal/vaginal intercourse, sexual disclosure to female partners and sexual behaviors, and predictor variables' sexual identity and female partner type.

Statistical analysis was conducted separately for men and women using behavioral subgroups of men. Binary and multinominal logistic regression analyses were performed. For Questions 1-3, binary logistic regression examined the relationship between outcome and predictor variables. Question 4 used multinominal logistics regression to determine if there was a relationship between the outcome variable, sexual behaviors, and the predictor variables. These data analyses were based on the research questions and the research design selected for the study. Descriptive statistical analyses were performed to describe the study sample, and covariates were not included in the statistical analyses. Descriptive statistical analyses were also used to describe the variables used in this study.

**Logistic Regression Assumptions**

Descriptive statistics were performed for the total population for study variables, sexual identity, and sexual behaviors in subpopulations of Black MSM. There are several assumptions related to conducting binary and multinominal logistics regression analysis: (1) appropriate outcome type – Binary- Multinomial must match the dependent variable. Dependent Binary has two outcomes; (Yes/No); Dependent multinomial has three or more outcomes; the model has at least one independent variable; each observation was independent of the other with mutually exclusive and exhaustive categories; linearity of

independent variables and log-odds; no strong influential outliers exist in data and absence of Multicollinearity.

**Logistics Regression and Hypothesis Testing.**

This study used logistics regression analysis to determine if there is a relationship between sexual identity and behavioral sex risk among Black men aged 18-40 residing in three diverse U.S. cities. For this study, the results of logistics regression are presented in terms of odds ratios and significance levels. A p-value less than .05 will indicate a statistically significant relationship and result in rejecting the null hypothesis in favor of the alternative hypothesis. SAPTCH data on Black MSM was used to analyze the following questions and hypotheses.

Research Question 1. What is the relationship between sexual identity and sexual behavioral risks among Black MSM?

H*0*1: There is no significant relationship between sexual identity and sexual behavioral risks among Black MSM.

H*A*1: There is a significant relationship between sexual identity and sexual behavioral risks among Black MSM.

Statistical analysis plan: Independent variables: Sexual Identity (4 categories); Dependent variables: High-Risk Sex Behaviors with Men (4 categories); Statistical tests: binary logistical regression: Significance Level ($a$ = 0.05): Power Level – 80% ($B$ = .20)

Research Question 2. What is the relationship between sexual identity, female partner types, and sexual behavioral risks?

H*0*2: There is no significant relationship between sexual identity, female partner

types, and sexual behavioral risks.

H*A*2: There is a significant relationship between sexual identity, female partner types, and sexual behavioral risks.

Statistical analysis plan: Independent variables: Sexual Identity (4 categories); Female Partner Types (3 categories); Dependent variables: High-Risk Sex Behaviors with Women (3 categories); Statistical tests: binary logistical regression: Significance Level ($a$ = 0.05): Power Level – 80% ($B$ = .20)

Research Question 3. What is the relationship between sexual identity, female partner types, and sexual orientation disclosure?

H*0*3: There is no significant relationship between sexual identity, female partner type, and sexual orientation disclosure.

H*A*3: There is a significant relationship between sexual identification, female partner type, and sexual orientation disclosure.

Statistical analysis plan: Independent variables: Sexual Identity (4 categories); Female Partner Types (3 categories); Dependent variables: Sexual orientation Disclosure (2 categories); Statistical tests: binary logistical regression; Significance Level ($a$ = 0.05): Power Level – 80% ($B$ = .20).

Research Question 4. What is the relationship between sexual identity and sexual behaviors among Black MSM?

H*0*4: There is no significant relationship between sexual identity and sexual behaviors among Black MSM.

H*A*4: There is a significant relationship between sexual identity and sexual

behaviors among Black MSM.

Statistical analysis plan: Independent variables: Sexual Identity (4 categories); Dependent variables: Sexual Behaviors (3 categories); Statistical tests: multinominal logistical regression: Significance Level ($a$ = 0.05): Power Level – 80% ($B$ = .20)

## Threats to Validity

The data collection method threatened the validity of secondary data (Creswell, 2014). This study was conducted on Black men only residing in three U.S. cities. The results of this study may not be able to generalize to other populations, not representative of the sample or other cities (Creswell, 2014). Additional threats to internal validity may be due to how the participants in the study were selected, which may predispose them to develop specific outcomes identified by the study (Creswell, 2014). In addition, MSM in this study identified stigmatized behaviors, which using Respondent-Driven Sampling (RDS) might not provide a representative sample of the study population (Iguchi et al., 2009).

## Ethical Procedures

Ethical issues for this study include permission to use the secondary data, the SATHCAP, considered a "restricted" data source. Permission to conduct this study was obtained from the Walden University Institutional Review Board (Walden IRB Approval Number 04-16-21- 0150042). An extension was granted, and the expiration date is May 23, 2023. An application to gain access to the SATHCAP restricts data from the ICPSR. A Restricted Data Use Agreement for Restricted Data from the Inter-university Consortium for Political and Social Research (ICPSR) was obtained on April 21, 2021.

Due to restrictions in this data which preclude release to a student, the student will serve as the co-investigator, whereas the Walden Chair is the investigator conducting the study.

## Summary

This study employed a quantitative cross-sectional design, and logistic regression analysis was performed to determine if a relationship exists between sexual identity and behavioral sexual risk in Black men aged 18-40. Measures for this study included sexual behaviors with men and women in the past six months. Specific behaviors related to sexual positioning and condom use, disclosure to female partners, and sexual behaviors, sexual risks behaviors for contracting and transmitting HIV infection were defined as engaging in unprotected sex between a participant, male partner, and/or female within the last six months. For this study, the results of logistics regression were presented in terms of odds ratios and significance levels. A p-value less than .05 indicated a statistically significant relationship existed.

This section identified several threats to validity related selection of participants related to data collection and issues with generalizations to other populations. Additional threats to internal validity may be due to how the participants in the study were selected based on specific, which may have predisposed them to develop certain outcomes identified by the study (Creswell, 2014). Ethical considerations include obtaining permission to access this secondary restricted data. Section 2 discussed the research design, rationale sampling, methodology, study population, sample size, sampling procedures, target populations, instrumentation, and statistical analysis plan. This section

will also discuss threats to validity and ethical procedures.

## Section 3: Presentation of the Results and Findings

Numerous researchers have explored sexual identity and sexual behaviors and how these factors contribute to high-risk sexual contact in subgroups of Black MSM. This quantitative study determined if sexual identity is related to behavioral sex risk in Black MSM. A cross-sectional design was appropriate for statistical analysis to determine if there was a relationship between predictors and sexual behavioral risk among the subgroups of Black men. Black MSM and Black heterosexual women have been identified as having a higher risk for HIV infection. Identifying the sexual identity associated with the highest risk sexual behaviors may assist in closing the gap regarding the high incidence and prevalence of HIV infection in Black MSM and heterosexual women. This study's findings provide information on the relationship between the high number of new cases in Black MSM and heterosexual women. Section 3 provides a summary of sociodemographic characteristics of the study participants and descriptives for all study question variables. Section 3 also provides findings from the statistical analysis for each question and provides results of the analysis.

### Study Sample, Data, and Variables

The sample for this study was limited to Black men aged 18-40, which consisted of 3,426 participants. The independent variables were categorized according to subgroups of sexual identity, gay or homosexual, bisexual, straight or heterosexual, down low, and female partner type, main partner, regular, and friend. The dependent variables were high-risk sexual positioning dichotomous questions related to anal and vaginal sexual

positioning behaviors (yes or no), and sexual orientation disclosure to female partners, with participants responding "yes" or "no." Age, marital status, education, and HIV status are the categorical covariates. Covariates were used to describe the study population and was not used to determine if there was a relationship between the independent and dependent variables.

**Management of Missing Data**

To conduct statistical analysis using secondary data, a large amount data is needed due missing data related to failure of participants to respond to survey questions also known as item response (Brick & Kalton, 1996). For this study, participants who refused to answer questions presented in the 2005-2008 SAPTCH data were excluded from the sample and the data analysis. Due to study participants' failure to respond to specific questions, participant response numbers for this study and data analysis numbers may differ for all data characteristics. Descriptive statistics were used in the study to classify frequencies for nominal data and were used to answer all study questions (see Wallace-Spurgin, 2019). Descriptive analysis for missing data was performed for each variable in Questions 1-4 and are presented in the question summary tables.

## Demographics

All participants for this study were Black men aged 18-40 residing in three diverse U.S. cities: Los Angeles, CA, Chicago, IL, and Raleigh, Durham, NC. Most study participants were from Chicago, IL (2,739, 58.4%), with 1,104 (23.5%) from Raleigh Durham, and 845 (18.0%) from Los Angeles, CA.

**Sociodemographic Characteristics by Sexual Identity**

Sexual identity was reported as gay or homosexual, bisexual, straight or heterosexual, and down low. Most participants in all sexual identity categories reported being in the age group 36-40, 493 (48.1%). Study data for Black MSM is consistent with prior studies; the majority of Black MSMW identify as heterosexuals and do not identify as gay or bisexual (Sandfort & Dodge, 2008). Black men reported their education level as a graduate from a 4-year college/university, followed by high school graduate (or GED), graduate or professional degree, and the lowest numbers reported in no formal Schooling. Most men reported being Single (never married, 1,949, 81.7%). A high number of men reported being sure they were HIV negative, 1,720 (65.1%). Table 3 provides a summary of sexual identity and socio-demographics for this study.

**Table 3**

*Sociodemographic Characteristics by Sexual Identity for Black Men who Have Sex with Men (N = 3,246)*

| | | Gay or homosexual N = 186 (6.6%) | Bisexual N = 515 (18.2%) | Straight or heterosexual N = 1968 (69.6%) | Down Low N = 157 (5.6%) |
|---|---|---|---|---|---|
| Participant Age Groups | 18 - 23 | 11 (15.3%) | 21 (11.2%) | 74 (13.8%) | 4 (7.5%) |
| | 24 - 29 | 8 (11.1%) | 27 (14.4%) | 82 (15.2%) | 11 (20.8%) |
| | 30 - 35 | 20 (27.8%) | 59 (31.4%) | 108 (20.1%) | 11 (20.8%) |
| | 36 - 40 | 33 (45.8%) | 81 (43.1%) | 274 (50.9%) | 27 (50.9%) |
| Education Level | No Formal Schooling | 5 (2.8%) | 10 (2.0%) | 25 (1.3%) | 3 (1.9%) |
| | High School Graduate (or GED) | 53 (29.6%) | 171 (34.8%) | 596 (31.4%) | 60 (39.0%) |
| | Graduated from 4-year College/University | 69 (38.5%) | 185 (37.7%) | 781 (41.1%) | 64 (41.6%) |
| | Graduate or Professional Degree | 52 (29.1%) | 125 (25.5%) | 497 (26.2%) | 27 (17.5%) |
| Marital Status | Single (never married) | 145 (87.9%) | 306 (86.0%) | 1,050 (79.7%) | 91 (82.7%) |
| | Legally married/legal domestic relationship | 5 (3.0%) | 24 (6.7%) | 152 (11.5%) | 9 (8.2%) |
| | Partnered or informally married, living together | 15 (9.1%) | 26 (7.3%) | 116 (8.8%) | 10 (9.1%) |
| HIV Status | I am sure I am HIV negative | 52 (59.8%) | 243 (60.9%) | 1,076 (67.9%) | 65 (59.1%) |
| | I may be HIV positive | 9 (10.3%) | 14 (3.5%) | 21 (1.3%) | 9 (8.2%) |
| | I am pretty sure that I am HIV positive | 2 (2.3%) | 9 (2.3%) | 21 (1.3%) | 1 (0.9%) |
| | I have no idea what my HV status is | 24 (27.6%) | 133 (33.3%) | 467 (29.5%) | 35 (31.8%) |

**Descriptive Characteristics of Female and Male Partners**

The highest numbers of female partners were reported in sexual identities straight of heterosexual (490, 18.7%) and bisexual (215, 29.7%), followed by down Low (42, 23.9%. Most male partners were reported as bisexual (57.7.9%). Table 4 provides a summary of female and male partners by sexual identity.

**Table 4**

*Female Partner- Male Partners by Sex Identification*

| | | Sex Identification | | | | |
|---|---|---|---|---|---|---|
| | | Gay or homosexual N % | Bisexual N % | Straight or heterosexual N % | Down Low N % | Total N % |
| Participant Type | Female Partner | 16 (4.2%) | 215 (29.7%) | 490 (18.7%) | 42 (23.9%) | 763 (19.6%) |
| | Male Partner | 15 (3.9%) | 57 (7.9%) | 513 (19.6%) | 30 (17.0%) | 615 (15.8%) |

**Descriptive Characteristics of Sexual Identity and Sexual Behavioral Sex Risks Among Black MSM**

The study variables for behavioral sex risks among men was measured by sexual identity and high-risk sexual positioning intercourse. Measured responses to sexual positioning questions were “yes” or “no.” The results of the descriptive analysis showed gay or homosexual and bisexual men engaged in higher numbers of high-risk sexual

positioning intercourse in contrast to straight or heterosexual and down low men. Table 5 summarizes sexual identity based on sexual identity and behavioral sex risk among men.

**Table 5**

*High-Risk Sexual Positioning Behaviors by Sexual Identity with Male Partners*

| | | Sex Identification | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Gay or homosexual (N=186) | | Bisexual (N=515) | | Straight or heterosexual (N=1968) | | Down Low (N=157) | |
| | | n | % | n | % | n | % | n | % |
| Insertive Anal Sex "Topped" You used a Condom | No | 46 | (73.0%) | 23 | (65.7%) | 18 | (94.7%) | 4 | (80.0%) |
| | Yes | 17 | (27.0%) | 12 | (34.3%) | 1 | (5.3%) | 1 | (20.0%) |
| Insertive Anal Sex "Topped" You did not use a Condom, You pulled out before you "came" | No | 54 | (85.7%) | 27 | (77.1%) | 17 | (89.5%) | 5 | (100.0%) |
| | Yes | 9 | (14.3%) | 8 | (22.9%) | 2 | (10.5%) | 0 | (0.0%) |
| Receptive Anal Sex "Bottomed" He used a Condom | No | 46 | (73.0%) | 30 | (85.7%) | 18 | (94.7%) | 3 | (60.0%) |
| | Yes | 17 | (27.0%) | 5 | (14.3%) | 1 | (5.3%) | 2 | (40.0%) |
| Receptive Anal Sex "Bottomed" He did not use a Condom, He pulled out before he "Came" | No | 54 | (85.7%) | 32 | (91.4%) | 18 | (94.7%) | 4 | (80.0%) |
| | Yes | 9 | (14.3%) | 3 | (8.6%) | 1 | (5.3%) | 1 | (20.0%) |

## Descriptive Characteristics of Sexual Identity and Sexual Behaviors

The study variables for sexual orientation were measured using two variables:

sexual identity and sexual behaviors. All sexual identity categories reported having low numbers of sex with equal numbers of men and women. Table 7 summarizes sexual orientation based on sexual identity and sexual behaviors.

**Table 6**

*Sexual Identity and Sexual Behaviors with Men and Women*

| | Sex Identification | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Gay or homosexual N=186 (6.6%) | | Bisexual N=515 (18.2%) | | Straight or heterosexual N=1968 (69.9%) | | Down Low N=157 (5.6%) | |
| | n | % | n | % | n | % | n | % |
| I Have Sex with Men Only | 127 | (84.1%) | 22 | (6.0%) | 589 | (85.4%) | 33 | (37.1%) |
| I Have Sex with Women Only | 17 | (11.3%) | 262 | (71.6%) | 73 | (10.6%) | 44 | (49.4%) |
| I Have Sex with Equal Numbers of Men and Women | 7 | (4.6%) | 82 | (22.4%) | 28 | (4.1%) | 12 | (13.5%) |

## Statistical Analysis

This study defined behavioral sex risks by sexual positioning behaviors with male and female partners based on unprotected insertive/receptive and vaginal/anal intercourse. The variables in the study were intended to measure binominal and

multinominal variables—sexual positioning behaviors, sex disclosure, and sexual behaviors—using logistics regression. Statistical analysis was conducted on each research question to determine if any relationship existed between self-reported self-identity predictor (independent) variables and sexual behavioral risk outcome (dependent) variables.

Odds ratios were used to indicate risk factors and the likelihood of an outcome occurring (Chen et al., 2010). Statistically significant results were relative to the odds ratio (Chen et al., 2010). An OR of 1 means no relationship with a specific risk in high or low-risk groups), ORs higher than 1 indicate risk factor in high or low-risk groups), and lower than 1 equal protective factor (Chen et al., 2010). A *p* value less than 0.05 is statistically significant and rejects the null hypothesis.

For Questions 1-3, binary logistics regression was conducted on dichotomous outcome variables. A multinomial logistics regression was conducted for categorical and outcome variables in Question 4. All assumptions were met for this statistical analysis. The dependent variables were defined and computed for each question based on total sample size, missing data, response number (yes or no), and categories. Analysis of sexual identity, down low, reported the parameter as being set to 0 because it is a redundant identity and was used as a reference. Responses varied by questions and were inconsistent with the number of study participants in the four sexual identity groups. The variable data for the research questions and statistical analysis results are summarized in the following sections.

**Statistical Analysis for Research Question 1**

**Research Question 1.** What is the relationship between sexual identity and sexual behavioral risks among Black MSM? For research questions 1, 4 high-risk behaviors with men were included in the analysis. The case summary includes 150 (4.4%) valid cases and 3376 (96.6%) missing data. The results of the variable data for high-risk sex behaviors with are summarized in Table 8.

**Table 7**

*High-Risk Sexual Positioning Behaviors among Black Men who Have Sex with Men*

| | | N | % |
|---|---|---|---|
| Insertive Anal Sex "Topped" You Used a Condom | No | 113 | (75.3%) |
| | Yes | 37 | (24.7%) |
| Insertive Anal Sex "Topped" You Did Not Use a Condom, You Pulled Out Before You "Came" | No | 128 | (85.3%) |
| | Yes | 22 | (14.7%) |
| Receptive Anal Sex "Bottomed" He Used a Condom | No | 119 | (79.3%) |
| | Yes | 31 | (20.7%) |
| Receptive Anal Sex "Bottomed" He did not Use a Condom, He Pulled Out Before He "Came" | No | 134 | (89.3%) |
| | Yes | 16 | (10.7%) |

A binary logistic regression analysis was conducted to test the hypothesis proposed in Question 1. The stepwise forward method was used to achieve the best-fit model using the probability-likelihood ratio statistics. The statistical analysis investigated

if there is a relationship between sexual identity and sexual behavioral risks among Black MSM? The predictor variables included: Sexual Identity, Gay or homosexual, Bisexual, Straight or heterosexual and Down Low- Reference. The outcome of interest was insertive anal sex; your penis in his anus "topped" you used a condom, yes/no.

The Hosmer-Lemeshow goodness-of-fit was significant X 2 .000, $p$ = 1.00, indicating the model is correctly specified. Additionally, the -2 log Likelihood = 131.314 and the variance explained in the model was Nagelkerke R squared = .082 (8.2%) and correctly classified 74.6% of the cases. The model resulted in IVs sexual identity not being statistically significant, 95% CI, p > *.05*.

The estimated odds ratio for sexual identity and sexual behavioral risk, insertive anal sex among Gay or homosexual OR 1.478, 95% CI .154 – 14.178, Straight or heterosexual OR .222, 95% CI .011 – 4.358 and Bisexual OR 2.087, 95% CI .209 – 20.811. The analysis results indicated insignificant relationships between sexual identity and sexual behavioral risk; insertive anal sex "topped" you used a condom and thus failed to reject the null. The results of the analysis are summarized in Table 9.

**Table 8**

*Binary Logistics Regression for Sexual Identity by High-Risk Sexual Positioning Insertive Anal Sex "Topped" You Used a Condom*

| | B | S.E. | Wald | Sig. | OR | 95% CI | |
|---|---|---|---|---|---|---|---|
| Sex Identification (1) | .391 | 1.154 | .115 | .735 | 1.478 | [.154 | 14.178] |
| Sex Identification (2) | .736 | 1.173 | .393 | .531 | 2.087 | [.209 | 20.811] |
| Sex Identification (3) | -1.504 | 1.518 | .981 | .322 | .222 | [.011 | 4.358] |
| Constant | -1.386 | 1.118 | 1.537 | .215 | 250 | | |

Variable(s): Sexual Identification: 1=Gay or homosexual: 2= Bisexual: 3- Straight or heterosexual: 4=Down Low- Reference

**Table 9**

*Insertive Anal Sex "Topped" You Did Not Use a Condom, You Pulled Out Before You "Came" by Sex Identification*

| | | Sex Identification | | | | |
|---|---|---|---|---|---|---|
| | | Down Low | Bisexual | Straight or heterosexual | Gay or homosexual | Total |
| Insertive Anal Sex "Topped" You Did Not Use a Condom, You Pulled Out Before You "Came" | No | 92 | 41 | 19 | 7 | 159 |
| | Yes | 15 | 11 | 2 | 0 | 28 |
| Total | | 107 | 52 | 21 | 7 | 187 |

For predictor variable Gay or homosexual, summary data for outcome variable, Insertive Anal Sex "Topped" You Did Not Use a Condom, You Pulled Out Before You

"Came" identified seven responses to the "no" and zero responses to "yes" totaling seven overall responses to this behavioral sex risk for this sexual identity group. A binary logistic regression analysis was conducted to test the hypothesis proposed in Question 1. The stepwise forward method was used to achieve the best-fit model using the probability-likelihood ratio statistics.

The statistical analysis investigated if there is a relationship between sexual identity and sexual behavioral risks among Black MSM. The possible predictor variables were Sexual Identity, Gay or homosexual, Bisexual, Straight or heterosexual, and Down Low - Reference. The outcome of interest was Insertive Anal Sex, your penis in his anus "topped" You Did Not Use a Condom, You Pulled Out Before You "Came, yes/no. The Hosmer-Lemeshow goodness-of-fit was significant X .088, $p = .993$, indicating the model is correctly specified.

Additionally, the -2 log Likelihood = 153.428 and the variances in the model was Nagelkerke R squared = .042 (4.2%) and correctly classified 85 % of the cases. The statistical analysis showed two of the sexual identity IVs, Bisexual, CI 683-3.845, $p > 0.05$ Straight or heterosexual, CI .126 – 2.953, $p > 0.05$ was insignificant in terms of the influence it has on Insertive Anal Sex, "Topped" You Did Not Use a Condom; You Pulled Out Before You "Came" the CI .000 $p > 0.05, .999$ and therefore the null cannot be rejected. The model results showed the test is inconclusive results for IV, Gay or homosexual CI .000, $p > .999$ due to the very low rate of seven "no" and zero "yes" responses.

According to Vittinghoff and McCulloch (2007) the rule of thumb for logistics

regression is 10 events per predictor variable (EPV). These events per independent variable are necessary to avoid an overfit model is between 10 and 20 events (Stoltzfus, 2011). Overfitting can occur when the model and creates a generalization error and is due to low samples (Vittinghoff & McCulloch, 2007). When there is a low EPV, the relationship between predictor and outcome variables can be biased and this leads to poor predictions (Vittinghoff & McCulloch, 2007). In addition, models with below 10 EVP can result in bias and unreliable CI's and in this IV Gay or homosexual, the small number did not show any statistically significant relationship (Vittinghoff & McCulloch, 2007). The results of the analysis are summarized in Table 11.

**Table 10**

*Binary Logistics Regression for Sexual Identity by High-Risk Sexual Positioning Insertive Anal Sex "Topped" You Did Not Use a Condom; You Pulled Out Before You "Came"*

| | B | S.E. | Wald | Sig | OR | 95% CI | |
|---|---|---|---|---|---|---|---|
| Sex Identification (1) | -19.412 | 15183.605 | .000 | .999 | .000 | [.000] | |
| Sex Identification (2) | .483 | .441 | 1.202 | .273 | 1.621 | [.683 | 3.845] |
| Sex Identification (3) | -.495 | .805 | .378 | .539 | .610 | [.126 | 2.953] |
| Constant | -1.927 | .393 | 23.990 | <.001 | .146 | | |

*Note.* Sexual Identification 1 = Gay or homosexual: 2= Bisexual: 3 =Straight or heterosexual:4= Dow Low- Reference

A binary logistic regression analysis was conducted to test the hypothesis proposed in Question 1. The stepwise forward method was used to achieve the best-fit model using the probability-likelihood ratio statistics. The statistical analysis

investigated if there is a relationship between sexual identity and sexual behavioral risks among Black MSM? The possible predictor variables were: Sexual Identity, Gay or homosexual; Bisexual; Straight or heterosexual; Down Low - Reference. The outcome of interest was Receptive anal sex, your penis in his anus "bottomed "he used a condom, yes/no.

The Hosmer-Lemeshow goodness-of-fit was significant X 2 .000, p = 1.000, indicating the model is correctly specified. Additionally, the -2 log Likelihood = 116.744 and the variances in the model was Nagelkerke R squared = .087 (8.7%) and correctly classified 79.5% of the cases. The model resulting in the IVs sexual identity was not statistically significant, $p > .05$.

The estimated odds ratio for sexual identity and sexual behavioral risk, receptive anal sex "bottomed" he used a condom among Gay or homosexual, OR .554 95% CI .085 – 3.610: Bisexual OR .250, 95% CI .033 – 1.893, and straight or heterosexual, OR .083, 95% CI .006 – 1.232. The analysis results indicated insignificant relationships between sexual identity and sexual behavioral risk, receptive anal sex and thus failed to reject the null. The results of the analysis are summarized in Table 12.

**Table 11**

*Binary Logistics Regression for Sexual Identity by High-Risk Sexual Positioning Receptive Anal Sex "Bottomed" He Used a Condom with Male Partners*

| | B | S.E. | Wald | Sig. | OR | 95% C.I. | |
|---|---|---|---|---|---|---|---|
| Sex Identification (1) | -.590 | .956 | .381 | .537 | .554 | [.085 | 3.610] |
| Sex Identification (2) | -1.386 | 1.033 | 1.802 | .180 | .250 | [.033 | 1.893] |
| Sex Identification (3) | -2.485 | 1.374 | 3.269 | .071 | .083 | [.006 | 1.232] |
| Constant | -.405 | .913 | .197 | .657 | .667 | | |

Variable(s): Sexual Identification: 1=Gay or homosexual: 2= Bisexual: 3-Straight or heterosexual: 4=Down Low- Reference

A binary logistic regression analysis was conducted to test the hypothesis proposed in Question 1. The stepwise forward method was used to achieve the best-fit model using the probability-likelihood ratio statistics. The statistical analysis investigated if there is a relationship between sexual identity and sexual behavioral risks among Black MSM? The possible predictor variables were: Sexual Identity, Gay or homosexual; Bisexual; Straight or heterosexual; Down Low. The outcome of interest was Receptive anal sex, your penis in his anus "bottomed" he did not use a condom, he pulled out before he "came" yes/no].

The Hosmer-Lemeshow goodness-of-fit was significant X 2 .000 p = 1.000 indicating the model is correctly specified. Additionally, the -2 log Likelihood = 84.990 and the variances in the model was Nagelkerke R squared = .031(3.1%) and correctly classified 84.4% of the cases. The model resulting in the IVs sexual identity was not statistically significant, 95% CI, $p > .05$. The estimated odds ratio for sexual identity and

sexual behavioral risk, Receptive anal sex not he did not use a condom, among Gay or homosexual, OR .667 95% CI .067 -6.664: Bisexual OR .375, 95% CI .031 – 4.525 and straight or heterosexual, OR .222, 95% CI .011 – 4.358. The analysis results indicated insignificant relationships between sexual identity and sexual behavioral risk receptive anal sex and thus failed to reject the null. The results of the analysis are summarized in Table 13.

**Table 12**

*Binary Logistics Regression of Sexually Identity by High-Risk Sexual Positioning Behaviors Receptive Anal Sex "Bottomed" he did not use a condom, with Male Partners*

| | B | S.E. | Wald | Sig. | OR | 95% C.I. | |
|---|---|---|---|---|---|---|---|
| Sex Identification (1) | -.405 | 1.175 | .119 | .730 | .667 | [ .067 | 6.664] |
| Sex Identification (2) | -.981 | 1.271 | .596 | .440 | .375 | [.031 | 4.525] |
| Sex Identification (3) | -1.504 | 1.518 | .981 | .322 | .222 | [ .011 | 4.358] |
| Constant | -1.386 | 1.118 | 1.537 | .215 | .250 | | |

Variable(s): Sexual Identification: 1=Gay or homosexual:2= Bisexual; 3- Straight or heterosexual; 4=Down Low- Reference

**Statistical Analysis for Research Question 2**

**Research Question 2.** What is the relationship between sexual identity, female partner type, and sexual behavioral risks? For research question 2, high-risk behaviors with female partners were included in the analysis. Case summary includes 354 (10.3%) valid cases and missing data 3072 (89.6%). The results of the analysis are summarized in Table 14.

**Table 13**

*Summary of High-Risk Sexual Positioning Behaviors with Female Partners*

| | | N | % |
|---|---|---|---|
| Vaginal Sex Without a Condom, You Pulled Out Before You "Came" | No | 296 | (83.6%) |
| | Yes | 58 | (16.4%) |
| Anal Sex Using a Condom | No | 315 | (89.0%) |
| | Yes | 39 | (11.0%) |
| Anal Sex Without a Condom, You Pulled Out Before You "Came" | No | 325 | (91.8%) |
| | Yes | 29 | (8.2%) |

A binary logistic regression analysis was conducted to test the hypothesis proposed in Question 2. The stepwise forward method was used to achieve the best-fit model using the probability-likelihood ratio statistics. The statistical analysis will investigate if there is a relationship between sexual identity, partner type and high-risk sexual positioning behaviors? The possible predictor variables were Sexual Identity, Gay or homosexual; Bisexual; Straight or heterosexual; Down Low – Reference, and Partner Type; Main, Regular Partner, Friend - Acquaintance - Reference. The outcome of interest was Vaginal Sex Without a Condom, He Pulled Out Before He "Came" yes/no.

The Hosmer-Lemeshow goodness-of-fit was significant X 2 5.258 p = .629, indicating the model is correctly specified. Additionally, the -2 log Likelihood = 230.318 and the variances in the model was Nagelkerke R squared = .009 (0.9%) and correctly classified 83.2% of the cases. The model resulting in the IVs sexual identity was not statistically significant 95% CI, $p > .05$). The estimated odds ratio for sexual identity and

sexual behavioral risk; Anal sex he did not use a condom, among Gay or homosexual, OR .425 95% CI .044 – 4.067; Bisexual, OR 1.055 95% CI .391 – 2.843 and straight or heterosexual OR .838, 95% CI .280 – 2.509.

Additionally, the estimated odds ratio for sexual identity and sexual behavioral risk; Receptive anal sex he did not use a condom, based on female partner types among Main, OR 1.143, 95% CI .406 – 3.21; Regular OR .868, 95% CI .284 – 2.654 and Friend OR .1.002, 95% CI .329 – 3.05. The analysis results indicated insignificant relationships between sexual identity and sexual behavioral risk anal sex, and female partner types, thus failing to reject the null. The results of the analysis are summarized in Table 15.

**Table 14**

*Binary Logistics Regression of Sexual Identity by High-Risk Sexual Positioning Behaviors Vaginal Intercourse Without a Condom, He Pulled Out Before He "Came "with Female Partners*

| | B | S.E. | Wald | Sig. | OR | 95% C.I. | |
|---|---|---|---|---|---|---|---|
| Sex Identification (1) | -.856 | 1.153 | .552 | .458 | .425 | [.044 | 4.067] |
| Sex Identification (2) | .053 | .506 | .011 | .916 | 1.055 | [.391 | 2.843] |
| Sex Identification (3) | -.177 | .560 | .100 | .752 | .838 | [.280 | 2.509] |
| Female Partner Type (1) | .133 | .528 | .064 | .801 | 1.143 | [.406 | 3.218] |
| Female Partner Type (2) | -.142 | .570 | .062 | .804 | .868 | [.284 | 2.654] |
| Female Partner Type (3) | .002 | .568 | .000 | .997 | 1.002 | [.329 | 3.055] |
| Constant | -1.566 | .645 | 5.906 | .015 | .209 | | |

*Note.* Variable(s): Sex Identification: 1=Gay or homosexual:2= Bisexual; 3- Straight or heterosexual; 4=Down Low- Reference - Female Partner Type: 1=Main: 2=Regular: 3= Friend; 4 Acquaintance=Reference

A binary logistic regression analysis was conducted to test the hypothesis proposed in Question 2. The stepwise forward method was used to achieve the best-fit model using the probability-likelihood ratio statistics. The statistical analysis will investigate if there is a relationship between sexual identity, partner type and high-risk sexual positioning behaviors. The possible predictor variables were Sexual Identity, Gay or homosexual; Bisexual, Straight or heterosexual; Down Low – Reference and Partner Type, Main, Regular Partner, Friend, Acquaintance - Reference. The outcome of interest was Vaginal Sex Without a Condom he "came" inside you, yes/no.

The Hosmer-Lemeshow goodness-of-fit was significant X 2 4.83 p = .680, indicating the model is correctly specified. Additionally, the -2 log Likelihood = 160.219 and the variances in the model was Nagelkerke R squared = .029 (2.9%) and correctly classified 90.2% of the cases. The model resulted in the all-sexual identity IVs sexual were not statistically significant 95% CI, $p > .05$. The estimated odds ratio for sexual identity and sexual behavioral risk; anal sex, not he did not use a condom, among Gay or homosexual OR 1.314 95% CI .117 – 14.789; Bisexual OR 1.118, 95% CI .296 – 4.227 and straight or heterosexual OR 1.439., 95% CI .352 – 5.886.

Additionally, the estimated odds ratio for sexual identity and sexual behavioral risk; anal sex not he did not use a condom, based on female partner types among Main OR 1.747, 95% CI .346 – 8.820; Regular OR 3.369, 95% CI .678 – 16.729 and Friend OR 1.677, 95% CI .305 – 9.218. The analysis results indicated insignificant relationships between sexual identity and sexual behavioral risk anal sex and female partner types, thus failing to reject the null. The results of the analysis are summarized in Table 16.

**Table 15**

*Binary Logistics Regression of Sexual Identity by High-Risk Sexual Positioning Behaviors with Female Partners, Vaginal Sex using a Condom, He "Came" Inside You*

| | B | S.E. | Wald | Sig. | OR | 95% C.I. | |
|---|---|---|---|---|---|---|---|
| Sex Identification (1) | .273 | 1.235 | .049 | .825 | 1.314 | [.117 | 14.789] |
| Sex Identification (2) | .112 | .678 | .027 | .869 | 1.118 | [.296 | 4.227] |
| Sex Identification (3) | .364 | .719 | .257 | .612 | 1.439 | [.352 | 5.886] |
| Female Partner Type (1) | .558 | .826 | .456 | .499 | 1.747 | [.346 | 8.820] |
| Female Partner Type (2) | 1.214 | .818 | 2.206 | .137 | 3.369 | [.678 | 16.729] |
| Female Partner Type (3) | 517 | .870 | .353 | .552 | 1.677 | [.305 | 9.218] |
| Constant | -3.097 | .964 | 10.318 | .001 | .045 | | |

Variable(s): Sex Identification: 1=Gay or homosexual:2= Bisexual; 3- Straight or heterosexual: 4=Down Low- Reference - Female Partner Type: 1=Main: 2=Regular: 3= Friend; 4 Acquaintance=Reference

A binary logistic regression analysis was conducted to test the hypothesis proposed in Question 2. The stepwise forward method was used to achieve the best-fit model using the probability-likelihood ratio statistics. The statistical analysis will investigate if there is a relationship between sexual identity and high-risk sexual positioning behaviors with females? The possible predictor variables were: Sexual Identity; Gay or homosexual; Bisexual; Straight or heterosexual; Down Low – Reference: Partner Type; Main, Regular Partner, Friend, and Acquaintance – Reference. The outcome of interest was Anal sex without a condom he pulled out before he "came", yes/no.

The Hosmer-Lemeshow goodness-of-fit was significant X 2 3.018 p = .883 indicating the model is correctly specified. Additionally, the -2 log Likelihood = 139.650 and the variances in the model was Nagelkerke R squared = .022 (2.2%) and correctly classified 91.8% of the cases. The model resulting in the sexual identity IVs sexual were not statistically significant 95% CI; $p > .05$). The estimated odds ratio for sexual identity and sexual behavioral risk; anal sex, not he did not use a condom, among Gay or homosexual OR 2.140 95% CI .286 – 16.011; Bisexual OR 1.063, 95% CI .280 – 4.035 and Straight or heterosexual OR .463., 95% CI .087 – 2.458.

Additionally, the estimated odds ratio for sexual identity and sexual behavioral risk; anal sex not he did not use a condom, based on female partner types among Main OR .674, 95% CI .170 – 2.661; Regular OR 1.274, 95% CI .336 – 4.831 and Friend OR .475, 95% CI .098 – 2.313. The analysis results indicated insignificant relationships between sexual identity and sexual behavioral risk anal sex and female partner types, thus failing to reject the null. The results of the analysis are summarized in Table 17.

**Table 16**

*Binary Logistics Regression of Sexual Identity by High-Risk Sexual Positioning Behaviors Anal Sex Without a Condom, He Pulled Out Before He "Came" with Female Partners*

| | B | S.E. | Wald | Sig. | OR | 95% C.I. | |
|---|---|---|---|---|---|---|---|
| Sex Identification (1) | .761 | 1.027 | .549 | .459 | 2.140 | [.286 | 16.011] |
| Sex Identification (2) | .061 | .680 | .008 | .928 | 1.063 | [.280 | 4.035] |
| Sex Identification (3) | -.770 | .852 | .817 | .366 | .463 | [.087 | 2.458] |
| Female Partner Type (1) | -.395 | .701 | .318 | .573 | .674 | [.170 | 2.661] |
| Female Partner Type (2) | .242 | .680 | .126 | .722 | 1.274 | [.336 | 4.831] |
| Female Partner Type (3) | -.744 | .807 | .849 | .357 | .475 | [.098 | 2.313] |
| Constant | -2.142 | .835 | 6.575 | .010 | .117 | . | |

Variable(s): Sex Identification: 1=Gay or homosexual: 2= Bisexual: 3- Straight or heterosexual: 4=Down Low- Reference - Female Partner Type: 1=Main: 2=Regular: 3= Friend; 4 Acquaintance – Reference

**Statistical Analysis for Research Question 3**

**Research Question 3.** What is the relationship between sexual identity, female partner type, and sexual orientation disclosure? For research question 3, variables; disclosure to female partners, female partner type. The case summary includes 257 (7.5%) cases and 3169 (92.5%) missing data.

A binary logistic regression analysis was conducted to test the hypothesis proposed in Question 3. The stepwise forward method was used to achieve the best-fit model using the probability-likelihood ratio statistics. A binary logistic regression analysis was conducted to investigate if there is a relationship between sexual identity

and partner type and sexual orientation disclosure? The possible predictor variables were: Sexual identity; Gay or homosexual; Bisexual; Straight or heterosexual; Down Low- Reference, and Partner Type: Main; Reference; Regular Partner; Friend, Acquaintance - Reference. The outcome of interest was Do Female Partners Know You Have Sex with Males, yes/no.

The Hosmer-Lemeshow goodness-of-fit was significant X 2 .894 p = .971, indicating the model is correctly specified. Additionally, the -2 log Likelihood = 306.008 and the variances in the model was Nagelkerke R squared = .084(8.4%) and correctly classified 68.9% of the cases. The model resulted in all of the IV Sexual identity, Gay or homosexual and Bisexual being statistically significant ($p < .05$). The logistics regression analysis found sexual identity, Gay or homosexual contributed to the model. The unstandardized $B = 1.872$, SE = .756, Wald = 6.136, $p = .013$. The estimated odds ratio for sexual identity and sexual behavioral risk; sexual disclosure to female partners among Gay or homosexual OR 6.50095% CI 1.478 – 28.58; Bisexual OR 3.089, 95% CI 1.188 – 8.029 and Straight or heterosexual OR 1.222, 95% CI .425 – 3.511.

Additionally, the estimated odds ratio for sexual identity and disclosure to female partners based on female partner types among Main OR 1.110, 95% CI .483 – 2.549; Regular OR .796, 95% CI .315 – 1.865*)* and Friend OR .796, 95% CI .326 – 1.948. The analysis results indicated a statistically significant relationship among sexual identity IV Gay or homosexual and Bisexual which allowed rejection of the null. The inverse of results was reported for IVs Straight or heterosexual identity and all DVs female partner types, and the analysis indicated an insignificant relationship, thus failing to reject the

null. The results of the analysis are summarized in Table 18.

**Table 17**

*Binary Logistics Regression of Sexual Identity and Partner Type by Sexual Orientation Disclosure to Female Partners*

| | B | S.E. | Wald | Sig. | OR | 95% C. I. | |
|---|---|---|---|---|---|---|---|
| Sex Identification (1) | 1.872 | .756 | 6.136 | .013 | 6.500 | [1.478 | 28.58] |
| Sex Identification (2) | 1.128 | .487 | 5.355 | .021 | 3.089 | [1.188 | 8.029] |
| Sex Identification (3) | .201 | .538 | .139 | .709 | 1.222 | [.425 | 3.511] |
| Female Partner Type (1) | .104 | .424 | .060 | .806 | 1.110 | [.483 | 2.549] |
| Female Partner Type (2) | -.266 | .454 | .344 | .557 | .766 | [.315 | 1.865] |
| Female Partner Type (3) | -.228 | .456 | .249 | .618 | .796 | [.326 | 1.948] |
| Constant | -1.481 | .580 | 6.512 | .011 | .227 | | |

*Note.* Variable(s): Sex Identification: 1=Gay or homosexual: 2= Bisexual: 3- Straight or heterosexual: 4=Down Low- Reference - Female Partner Type: 1=Main-Reference: 2=Regular: 3= Friend: 4= Acquaintance – Reference

**Statistical Analysis for Research Question 4**

**Research Question 4**. What is the relationship between sexual identity and sexual behaviors among Black MSM? For research question 4, sexual behaviors between men and women were included in the analysis. The case summary includes a combined 1296 (37.8%) valid cases and 2130 (62.1%) missing data. The case summary of sex behaviors among men by sexual identity is summarized in Table 19.

**Table 18**

*Summary of Sexual Behaviors among Men and Women by Sexual Identity*

| | N | % |
|---|---|---|
| Sex Behaviors with Men and Women | | |
| I Have Sex with Men Only | 771 | (59.5%) |
| I Have Sex with Women Only | 396 | (30.6%) |
| I Have Sex with Equal Numbers of Men and Women | 129 | (10.0%) |
| Sex Identification | | |
| Gay or homosexual | 151 | (11.7%) |
| Bisexual | 366 | (28.2%) |
| Straight or heterosexual | 690 | (53.2%) |
| Down Low | 89 | (6.9%) |

A multinomial logistic regression analysis was conducted to test the hypothesis proposed in Question 4. The stepwise forward method was used to achieve the best-fit model using the probability-likelihood ratio statistics. A multinomial logistic regression analysis was conducted to investigate if there is a relationship between sexual identity and sexual behaviors among Black MSM. The possible predictor variables were Sexual identity, Gay or homosexual; Bisexual; Straight or heterosexual; Down Low – Reference. The outcomes of interest where I have sex with men only, I have sex with equal numbers of men; and women and I have sex with women only - Reference.

The Hosmer-Lemeshow goodness-of-fit was significant $p < .05$ indicating the model is correctly specified. Additionally, the -2 log Likelihood = 799.572 and the Nagelkerke R squared = .532% correctly classified 78.9% of the cases. The multinomial logistics regression analysis found all three sexual identity IVs, Gay or homosexual,

Bisexual and Straight or heterosexual contributed to the model and were statistically significant to sexual behavior, I have sex with men only. The unstandardized $B$ = 1.887, $SE$ = .514, $Wald$ = 13.464, $p < .05$).

The estimated odds ratio for sexual identity and sexual behavioral risk; I have sex with men only among Gay or homosexual OR 9.961 CI 5.055 – 19.626; Bisexual OR .112, 95% CI .060 – .210) and Straight or heterosexual OR 10,758, 95% CI 6.443 – 17.964 was statistically significant, allowing rejection of the null. The estimated odds ratio for sexual identity and sexual behavioral risk; I have sex with equal numbers of men and women among Gay or homosexual OR 1.510 CI .509 – 4.478; Bisexual OR 1.148, 95% CI .579 – 2.276 and Straight or heterosexual identification OR 1.406, 95% CI .649 – 3.046 was not statistically significant, thus failed to reject the null. The results of the analysis are summarized in Table 20.

**Table 19**

*Multinomial Logistics Regression for Sexual Behaviors among Men and Women by Sexual Identification*

| | | B | S.E. | Wald | Sig. | OR | 95% C.I. | |
|---|---|---|---|---|---|---|---|---|
| I Have Sex with Men Only | Sex Identification (1) | 2.299 | .346 | 44.132 | <.001 | 9.961 | [5.055 | 19.626] |
| | Sex Identification (2) | 2.190 | .320 | 46.866 | <.001 | .112 | [.060 | .210] |
| | Sex Identification (3) | 2.376 | .262 | 82.478 | <.001 | 10.758 | [6.443 | 17.964] |
| I Have Sex with Equal Numbers of Men and Women | Sex Identification (1) | .412 | .555 | .552 | .458 | 1.510 | [.509 | 4.478] |
| | Sex Identification (2) | .138 | .349 | .155 | .694 | 1.148 | [.579 | 2.276] |
| | Sex Identification (3) | .341 | .394 | .748 | .387 | 1.406 | [.649 | 3.046] |

*Note*. Variable(s): Sex Identification: 1=Gay or homosexual:2= Bisexual; 3- Straight or heterosexual; 4=Down Low- Reference – Sexual Behaviors; I Have Sex with Men Only; I Have Equal Number of Sex with Men and Women: I Have Sex with Women Only- Reference.

## Summary

To determine if a relationship existed between sexual identity and sexual behavioral risks, four questions were analyzed using logistics regression. In Black MSM populations, an increased behavioral risk exists for HIV infection (CDC, 2021). Three distinctive transmission routes for HIV infection include anal, vaginal intercourse, and intravenous drug use (Lavoie & Fisher, 2017). New HIV infection diagnoses reported in 2019 were reported as male-to-male contact (MMSC) and heterosexual contact, with

rates of 80% and 90%, respectively (CDC, 2022).

This study researched two sexual positioning behaviors, RAI, a high-risk transmission route for HIV infection, and AI, identified as a primary route for transmission in MSM and heterosexual women (Lavoie et al., 2017). The study results showed for Questions 1 and 2 among Black MSM in the U.S., there was no statistically significant relationship between IVs sexual identification and DVs sexual behavioral risks. For research Question 3, Gay or homosexual and Bisexual sexual identity was statistically significant in disclosing sexual orientation to female partners. However, identifying as Straight or heterosexual and female partner type was not statistically significant in disclosure.

Question 4 statistical analysis resulted in all sexual identities, Gay or homosexual, bisexual and straight or heterosexual, had a statistically significant relationship with sexual behaviors with having sex with men; however, on the contrary, sexual identity did not have a statistically significant relationship with having sex with women only. Covariates were excluded from the statistical analysis. Section 3 provided descriptive data for the sample populations, missing data, data and variable derivation, and descriptive characteristics for study questions. Section 3 also provided a statistical analysis plan, statistical analysis for questions 1-4, tables, and presented the results.

## Section 4: Application to Professional Practice and Implications for Social Change

The quantitative study was conducted to examine whether a relationship existed between sexual identity and behavioral sex risks among Black MSM aged 18-40. According to the CDC (2022), new HIV infection diagnoses occur mainly due to male-to-male sexual contact (MMSC). In the United States, approximately one-third of U.S. women have participated in heterosexual anal intercourse, which has an increased risk for HIV infection and other STDs versus vaginal intercourse (Benson et al., 2019).

Secondary data from the SATHCAP, a multisite cross-sectional study conducted in three U.S. cities (Los Angeles, CA, Chicago, IL, and Raleigh-Durham, NC) was used to answer the research questions and to test the hypotheses. Data were collected on demographics, sexual identity, behavioral sexual risks, sexual behaviors, and disclosure of sexual orientation with various partner partners over the past 6 months. Statistical analysis was performed on the SATHCAP survey data using SPSS version 28. Section 4 provides an in-depth overview and interpretation of the study findings, the limitations of the study, recommendations for future research, implications for social change and professional practice, and the conclusion.

### Interpretation of Findings

In the United States approximately one-third of U.S. women have participated in heterosexual anal intercourse which has an increased risk for HIV infection and other STDs versus vaginal intercourse (Benson et al., 2019). According to the CDC (2022), new HIV infections diagnoses occur mainly due to male-to-male sexual contact (MMSC). To determine if a relationship existed between sexual identity and behavioral

risk in men and women, the first three questions were analyzed using binary logistics regression. The data showed men were more likely to engage in high-risk behavioral sex with men. Based on the statistical analysis results for Question 1, it failed to reject the null at $p > .05$.

In this study, men who identified as gay or homosexual engaged in higher numbers of condomless anal intercourse with men. This finding is consistent with other studies of male sexual identity and sexual behaviors (Rutledge et al., 2018). The results of this study related to sexual positioning risk behaviors among Black MSM and their female partners are consistent with other study results involving men who engage in unprotected RAI and unprotective IAI or both with different partners (Dangerfield et al., 2017). Numerous disparities exist in the Black women's population for new HIV infection rates (CDC, 2022). The results of this study for Question 1 are consistent with other study results reporting that sexual positioning behaviors involve men who engage in unprotected RAI and unprotective IAI or both with different partners (Dangerfield et al., 2017).

Statistical analysis for Question 2 indicated sexual identity did not have a statistically significant relationship to high-risk sexual positioning behaviors among women. The primary route for HIV transmission for Black women is by having heterosexual sex (Friedman et al., 2014; Sales & Sheth, 2018). Widely recognized in research is the high transmission risks for HIV/STD infection related to unprotected anal intercourse (Benson et al., 2019). The odds ratio for sexual identity gay or homosexual, bisexual and straight or heterosexual, and partner type was not statistically significant in

engaging in high-risk sexual vaginal and anal intercourse behaviors with women.

The data indicated men were likelier to engage in high-risk behavioral sex with women. For Question 2, the *p* value and significance level were not statistically significant and failed to reject the null. In contrast, German et al. (2015) noted women who engage in unprotected vaginal intercourse are at a three-time higher risk transmission risk for STDs versus a four-time higher transmission risk in women who reported using a condom in anal or vaginal intercourse. Newcomb and Mustanski (2013) similarly did not find any differences in identity and engaging in condomless vaginal/anal intercourse among female partners.

Results from the statistical analysis for research Question 3 indicated men who identified as gay or homosexual and bisexual were more likely to disclose sexual behaviors. The analysis results indicated female partner types were not statistically significant in disclosure. According to the BBT, lack of disclosure of men's sexual orientation places both men and women at an increased risk for HIV infection and is related to their behavioral sex risk (Malebranche et al., 2010).

Black men on the down low and Black MSMW who fail to disclose their same-sex behaviors to female partners place their female partners at increased risk for HIV (Malebranche et al., 2010). However, consistent with research conducted by Schrimshaw et al. (2016), difficulties in disclosing sexual identity are associated with stigma and homophobia; however, both bisexual and gay men disclose their identity. In addition, Allen et al. (2015) reported Black MSM who engaged in behavioral bisexual sex with women disclosed their bisexuality and sex behaviors contrasting other race/ethnic groups

of men.

Results from the statistical analysis for Question 4 indicated all IVs, Gay or homosexual, bisexual, straight or heterosexual identities were associated with odds of men having sex with men only $p < 0.05$. However, bisexual and straight or heterosexual men were less likely to report having sex with men only. There was no association between sexual and those reported having sex with equal numbers of men and women $p > 0.05$, therefore, the null was rejected. Results for research Question 4 are consistent with behavioral characteristics research which reported MSM of all races/ethnicities had recognized differences between MSMO and MSMW (Rutledge et al., 2018). Research has reported there were significant differences in identifying subgroups of Black MSM however, there is still a lack of consensus on how it impacts behavioral risks, sexual positioning risks, and heterosexual anal intercourse in male and female partners (Alexander et al., 2015; Rutledge et al., 2018; Wilson & Miyashita, 2016).

## Theoretical Applications

This study determined if relationships existed between sexual behavioral risks, condom use with male/female partners, sexual disclosure to female partners, and sexual orientation practices among Black MSM aged 18-40. Past decades of investigating HIV infection risks have concentrated on networking theories and the associative sexual contact among individuals described by theoretical network models. This study used the BBT to focus on the study variables, interpret the results, and support the methodology used for this study.

The BBT is a decision-based theory used to guide this study and proposed to

provide an understanding of the connection between two groups, sexual identity disclosure, and condom use (Malebranche et al., 2010). Having condomless anal and vaginal intercourse has been determined to be a significant transmission route for HIV infection. The decision related to engaging in unprotected sex have been used in research to explain high risk behaviors but have not provided any in-depth understanding of sexual behavioral risk among Black bisexual men (Malebranche et al., 2010). BBT was used to guide this study to understand behaviors in sub-groups of men considered to be a bridge in transmitting HIV infection and other STDs.

## Limitations of the Study

There are a few limitations to this study. First, no data was collected for this study, and the data used was limited to SATHCAP data collected in two phases: Phase I: September 2005 and December 2006) and Phase II: November 2006 and August 2008. Another limitation is the age of the study participants of 18-40. The majority of the participants in this study were between the ages of 30-40 which has been reported by the CDC as showing a decrease in HIV infection from 2015-2019. Secondly, this study was conducted on Black MSM aged 18-40 in three U.S cities, and the results cannot be generalized to other Black men in other cities, other age groups, or other races/ethnicities. Third, the timeframe of the collected data could present issues of recall bias.

Additional, limitations of this study include ambiguities in defining sexual identity when conducting this type of research. The SATHCAP secondary data which may not provide a comprehensive account of Black MSM's sexual risk behaviors. The results of this study may not be able to make inferences related to sexual behaviors. Other

limitation of this the study is related to design which looked at a population sample at a point in time, and the data collection design of RDS, which recruited partners of partners where they received payment. The study suggests participants may have responded to questions using socially acceptable responses which showed sexual identity did not predict high-risk sexual behaviors which may impact validity of responses.

Missing data in the study may have reduced the statistical power, improved the likelihood the null would be rejected when false, and could have created biased results (Hughes et al., 2019). There were low response rates to questions, and which made it difficult to show a relationship between the variables. Another limitation is the small EVP's which created an overfit model which could only be corrected by the "rules of thumb" which requires at least 10 or more outcomes for each variable. Although there were limitations in this study, this study still yielded valuable insight into the research questions. The research also provided an in-depth understanding of patterns of high-risk sexual behaviors used to identify the manner in which HIV infection is being spread.

## Recommendations for Future Research

This study aimed to determine if any relationships existed between sexual identity and behavioral risks among Black MSM aged 18-40 residing in three U.S. cities. The stigma associated with Black MSM, and their sexuality presents numerous opportunities for conducting socially sensitive research on sexual identity, sexual behaviors, and partner networks. In the socially constructed category in the 1990s of MSM, it was behaviors and not sexual identity recognized by this category (Young & Meyer, 2005). Although the study did not indicate statistically significant associations between sexual

identity and sexual behavioral risk among Black MSM, the results provided an avenue to perform future research to provide more understanding of sexual positioning risks among Black MSM.

To date, a lot of research has been conducted on sexual identity using a well-known and universal approach of self-identification using four categories of Gay, Bisexual, Straight, and Down Low. However, no universal measurement relates to sexual behaviors, sexual positioning preferences, and identity among MSM and MSMW (Dangerfield et al., 2017). This study used self-reported sexual identities, Gay, Bisexual, Straight, and Down Low, which have consistently been identified in past and current research.

In addition, few studies have been conducted to determine relationships among socially constructed behaviors of men who have sex with men (MSM), MSMO, MSMW, men who have sex with women, and their behavioral risk for HIV infection. In addition, according to Rutledge et al. (2018), distinguishing identity based on two categories of MSM (behaviorally homosexual) and MSMW (behaviorally bisexual) could provide a better approach to reporting sexual identity for study purposes.

Future research on Black MSM using MSM, MSMW, MSMO, and MSWO could provide a better measure of sexual identity along with high-risk sexual behaviors which result in the outcome of HIV infection. A cross-sectional study design with smaller samples and the randomized response technique data collection method could better understand sexual identity/orientation and high-risk sexual positioning risks in Black MSM and Black heterosexual women.

In addition, using a cross-sectional randomized response design, with data being collected using the randomized response technique could provide better results and develop survey questions that, specifically address HIV infection risks in the population of Black MSM and Black heterosexual women (Dietz et al., 2018). To possibly eliminate response bias and failure to respond to sensitive questions related to sexual identity and behaviors, randomized response technique data collection is more appropriate (Dietz et al., 2018). Additionally, the results from this study could provide an opportunity to develop a theoretical framework which comprehensively address sexual risk behaviors among Black MSMW.

## Implications for Professional Practice and Social Change

A few implications for professional practice and positive social change resulted from this study. This study was designed to determine if there were relationships between self-reported sexual identity and behavioral sex risk among Black MSM and their female partners. The results of this study highlight the need to address in more detail to further the understanding of sexual behaviors and behavioral sex risks in two high-risk populations, Black MSM and heterosexual women.

This study provided significant evaluation in understanding sexual identity and how it affects sexual positioning risk among Black MSMWs and their female partners. Understanding if sexual behaviors are intertwined with sexual identity, is crucial for developing syndemic public health prevention programs for these two-high risk groups. Public health practitioners and epidemiologists could use the results of this study to assist in developing psychological and cultural programs designed to address the stigma and

marginalization associated with being a sexual minority.

Public health syndemic programs should address education on all transmission risks present in high-risk behaviors to decrease the risk and number of new infections in the Black men and heterosexual women's populations. Additional findings from this study suggest the need for public health to identify community-level risk factors in a syndemic approach to HIV prevention programs to increase HIV testing and compliance with medical treatment regimens, thus decreasing the new HIV infection rates in two high-risk populations of Black MSMW and Black heterosexual women.

In addition, developing a prevention program which addresses additional social contributory factors continuing HIV infection epidemic in the Black population and facilitates the adoption of lifelong skills to negotiate safe sex behaviors among Black MSM and Black heterosexual women. According to Dacus and Sandfort (2020), a well-known practice in prevention research in Black MSM is to explore syndemic circumstances and gain an understanding of the factors fueling the HIV epidemic.

## Conclusion

MSM are a high-risk population for HV infection, however, it has been challenging to assess the magnitude of the risk due to the failure to adequately ask questions about sexual behaviors and orientation due to the stigma and (Mauck et al., 2019). This study was conducted to determine if a relationship existed between sexual identity and sexual positioning behavioral risks in Black Men aged 18-40 residing in the three U.S. cities. The categorization of the sexual construct of MSM hypothesizes sexual identity is not significant to sexual behaviors (Wilson & Miyashita, 2016).

According to Hill et al. (2017), research in the past has unintentionally measured heterosexuality and categorized it into other sexual orientation groups which led to misaligned results and erroneous classifications. According to Wilson & Miyashita, 2016, Boellstroff (2011) argued:

> as originally formulated, the MSM category took the constituent terms "men" and "sex" as stable and self-evident. The notion of "men who have sex with men but do not identify as gay" treats identity as a social construction but reifies "men" and "sex" as discursive, conflating sex with penetration above all, anal–penile intercourse and maleness with biology. (p. 3)

The importance of the study was it provided a more in-depth understanding of behavioral sexual risks associated with self-reported sexual identity in sub-groups of Black MSM.

The results of this study emphasize the importance of high-risk sexual positioning behaviors rather than the role of self-identified sexual identity has on these behaviors. Findings of this study consistent with prior research reporting sexual behaviors are related to masculinity IAI (Tops) and femininity RAI (Bottoms) and have less to do with sexual identity (Johns et al., 2012; Dangerfield et al., 2017). In addition to identifying risks in Black MSM related to sexual positioning behaviors and lack of condom use, the participants in this study reported a high number of "pulling out before cumming".

This sexual practice has identified HIV infection in pre-cum (Politch et al., 2016). Although the risk of HIV infection is significantly lower than with full ejaculation, a risk still exists in this sexual practice and requires further exploration (Politch et al., 2016). However, this research does raise additional questions related to the role sexual identity

has on behavioral sex risks in Black MSMW, consistent with gaps identified in the literature reviewed for this study.

Public health prevention programs should address education on all transmission risks present in high-risk behaviors including the sexual risk associated with pre-cum and the risk associated with the practice of pulling out before cumming. In addition, according to Smith et al. (2022) it is a misconception to rely solely upon research-based method related to theory in the HIV infection rates. Failure to take into consideration of combined social influences and/or identities may not facilitate an end to the HIV epidemic (Smith et al., 2022).

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## Appendix: Questionnaire

Q373: do female partners know you have sex w males

0=No
1 = Yes

Q564. Using the types of sexual partners that we asked you about previously, how would you best describe [SRF]? (Choose one)
Main
Regular Partner
Friend

High Risk Behaviors Female Partners

Q614C.The last time that you had sex with [SRF] what did you do? Vaginal sex without a condom, you pulled out before you "came"

Q614E.The last time that you had sex with [SRF] what did you do? Anal sex (your penis in her anus) using a condom

Q614F.The last time that you had sex with [SRF] what did you do? Anal sex without a condom, you pulled out before you "came"

High-Risk Behaviors Male Partners

Q724C. The last time that you had sex with [SRM] what did you do? Insertive anal sex (your penis in his anus "topped") you used a condom

Q724D. The last time that you had sex with [SRM] what did you do? Insertive anal sex (your penis in his anus "topped") you did not use a condom, you pulled out before you "came"

Q724F. The last time that you had sex with [SRM] what did you do? Receptive anal sex (his penis in your anus "bottomed") he used a condom

Q724G. The last time that you had sex with [SRM] what did you do? Receptive anal sex (his penis in your anus "bottomed") he did not use a condom, he pulled out before he "came"

Independent Variables

Self-Reported Sexual Identity

Q1285: How you identify yourself sexually

Gay or homosexual
Bisexual
Straight or heterosexual
"Down low"

Question: Q1286. I'd like you to tell me which of the following statements best describes your sexual behavior? (Choose one)
I have sex only with men
I have sex only with women
I have sex with about equal numbers of men and women

Covariates

What is your age? Are you: (Choose one) Study age groups -18-40 years* *The variable "AGE" was not asked directly of participants but was calculated from their date of birth. Date of birth is not included in this data set.

Q19B: Black/African American: race

Q45. What is the highest level of education you have completed? (Choose one)
No Formal Schooling
High School Graduate (or GED)
Graduated from 4 year College/University
Graduate or Professional Degree

Q48. What is your current marital/partnership status? (Choose one)
Single (never married)
Legally married/legal domestic partnership
Partnered or informally married, living together

Q82. What do you think your HIV status is now? (Choose one)
I am sure I am HIV-negative
I may be HIV-positive
I am pretty sure I am HIV-positive
I have no idea what my HIV status is

*Note:* These questions were reprinted from the Sexual Acquisition and Transmission of HIV Cooperative Agreement Program, 2006-2008 (Iguchi et al, 2009).