

The Role of Knowledge in the Adoption of PrEP by Black Gay and Bisexual Men in Ohio

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Abstract

Original Research Article

African American men who have sex with men, who were disproportionately affected by the HIV epidemic, were the least likely to adopt PrEP when compared with other ethnic or racial populations not only in Ohio but across the United States. The purpose of this research is to examine the relationship between Knowledge of PrEP and the adoption of PrEP for the prevention of HIV among African American Gay and Bisexual men in Ohio.

Methods: The association between preexposure prophylaxis (PrEP) knowledge and the adoption of PrEP was examined in a sample of 123 self-identified HIV-negative adult black gay and bisexual men in the state of Ohio between November 2023 and January 2024 in a cross-sectional study. Age, the highest level of education attained, and the participants' annual income were identified as possible confounders.

Results: A statistically significant and positive association existed between PrEP knowledge and the willingness to adopt PrEP, with a 271.2% increased likelihood of PrEP adoption per unit increase in knowledge after adjusting for age, income, and educational level.

Discussion and Recommendation: PrEP adoption has the potential to reduce health inequality for black gay and bisexual men. Implications for positive social change include policymakers and public health providers designing culturally competent policies and programs with consideration of knowledge; such policies and programs can improve the health and lives of this at-risk group of men.

Keywords: PrEP Adoption, HIV Prevention, African American Men, Gay And Bisexual Men, Health Inequality, Public Health Policy, PrEP Knowledge.

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INTRODUCTION

Pre-exposure prophylaxis or PrEP, a metabolic approach for the prevention of HIV infection, was first approved by the United States Food and Drug Administration in 2012 (Mayer, H.K., & Agwu, A., 2020). The original medication consisted of a combination of two antiretrovirals; tenofovir disoproxil fumarate or TDF and emtricitabine. The rationale for the choice of the combination drugs was based on extensive animal studies and then, case-control human studies in humans which demonstrated the effectiveness of the combination drug called travuda to prevent rectal mucosal transmission of both simian and human immunodeficiency virus in macaques (Mayer, H.K., & Agwu, A., 2020). The early medication (Travuda) was a single daily dose of 300 mg of the combined drugs. Initial FDA approval was for patients at elevated risk of HIV infection, including MSM, heterosexual men and women with multiple partners, and

injection drug users who shared equipment. There are new additions to Travuda which address some safety concerns and the frequency of dosing. Research is in progress to identify other drugs with more benefits. Approval came with some controversies which were concerned with the needed safety threshold for a longer time treatment for those who are otherwise healthy, costs, the possibility of the long-time treatment leading to the development of resistant strains, and the possibility of risk compensation regarding the

Knowledge and awareness of PrEP are well-described cognitive barriers to PrEP adoption in the United States (Eaton A. L., & Mathews D.D., 2017). Despite the efficacy of PrEP and the high disparity of HIV infection rates among BMSM, PrEP knowledge, and awareness are poor among BMSM when compared to other races or ethnic groups. In his study, Kahle et al. (2018) found that African Americans with lower education have lower knowledge scores (adj OR .56, 95%, CI 0.34-0.84, $p = .005$) and

willingness to use PrEP when compared to Whites. He found no relationship between PrEP knowledge and the age of the respondents (Kahle et al., 2018). In another study, Strauss et al (2017) conducted in large cities of Chicago, Atlanta, New York, and some others, found that 67% of the participants reported awareness but with demographic variability. Using logistic regression, Kahle et al. identified the association between PrEP awareness and use. Among participants who had never used PrEP, 16.9% do not know about PrEP, and another 15.6% heard about PrEP but had no clue what it was. Thirty-two percent knew about it, but not much, and only 25.8% have a fair amount of knowledge of PrEP. Eaton et al. (2017) conducted quantitative research on PrEP awareness and uptake among black men and transgender women who have sex with men in a multicity assessment during a gay pride event (Eaton A. L, & Mathews D.D., 2017). In this classic study, the researchers found that 39% of the participants were aware of PrEP and only 4.6% were using PrEP at the time. A multivariate analysis conducted also demonstrated that PrEP awareness is positively associated with being in a relationship, testing for HIV within the last 6 months, and awareness of own sexuality. Level of education and condom use was found to be negatively associated with the use of PrEP despite the elevation of awareness in the two groups (Eaton A. L, & Mathews D.D., 2017).

METHODS

This cross-sectional quantitative study examined the association between PrEP stigma, PrEP knowledge, and medical mistrust and the adoption of PrEP by black gay and bisexual men in the state of Ohio. I utilized a cross-sectional quantitative research design to collect data from a sample of Black gay and bisexual men in Ohio.

Research Design

The study population is African American men who are older than 18 years and who identify as gay or bisexual and consider Ohio as their primary residence. They must have tested negative for HIV in the last 6 months. According to the 2020 census, the estimated percentage of Ohio residents who identified as Gay is approximately 0.3%. The William Institute estimated the percentage of African American LGTBQ men in Ohio at 4.3%. The US Community Survey of 2021 (US Census, 2021) suggests that about 615,000 black men are above the age of 18. Therefore, (4.3% x 615,000) approximately 2,795 could belong to the LGTBQ community.

Sampling Strategy

The Institute of Medicine (NCBI, 2020) recommended venue-based, time-space sampling. This method involves identifying and selecting venues where the target population is likely to congregate, such as bars, clubs, or community centers, and then randomly sampling individuals who visit those venues during specified periods. This method can help overcome some of the challenges of accessing a hidden or stigmatized population, such as low response rates,

underrepresentation, or self-selection bias. Identified venues will be visited across some Ohio cities for data collection.

Sampling Size

Using the G-Power calculator, the sample size was determined to be 104 participants at an alpha level of 0.05, an effect size of .3, and a power of .80 with logistic regression. The power of 0.80 was based solely on G-power calculation without consideration for prior studies.

Recruitment of Participants

Using the **venue-based, time-space sampling** strategy, participants were recruited from identified gathering places for the Black gay community such as bars, events, bathhouses, and community-based organizations. Participants were asked to refer to friends and contacts who they believe will be likely to participate in the group. Upon agreement and following the discussion of confidentiality and privacy, each participant was required to sign the informed consent, which was incorporated into the QR code as part of the introductory page. Participants that preferred paper and pencil were allowed to do so and their responses were later transferred to the Google form.

Demographic Information: Participants were asked to provide information about the age group, race, sexual orientation, education level, and income.

Sexual Behavior: Participants will be asked about their sexual preferences.

PrEP Uptake: Participants will be asked about their use of PrEP or future acceptance of PrEP for the prevention of HIV infection.

Each participant signed an informed consent after explaining the purpose of the research, the implication, the voluntary nature of participation, their autonomy, assurance of privacy, and confidentiality as well as their right to withdraw at any time. The document provided by the Walden IRB was incorporated into the form verbatim as approved. IRB approval was obtained from Walden University before data collection.

Study Variables

Dependent Variables

The dependent variable is the willingness to adoption of PrEP by the participants. There are two responses which would be YES or NO.

Independent Variables

The knowledge of PrEP, by the population under study is the independent variable. PrEP knowledge is a key factor that influences PrEP uptake among African American MSM (Calabrese, S.K., 2020). The author noted that lack of knowledge about PrEP, its effectiveness, and its availability are significant barriers to PrEP uptake among African American MSM. She also found that African American MSM who were aware of PrEP were more likely to use it than those who were not aware of it (Calabrese, 2020). Chittamuru, et. al., (2020) found that African American MSM who had higher levels of PrEP knowledge were more likely to use PrEP than those with lower levels of knowledge. They also found that African American MSM who had higher levels of PrEP knowledge were more likely to have positive attitudes towards PrEP and perceive fewer barriers to its use.

RESULTS

Descriptive Statistics

Table: 1. Age Group

Age group	Frequency	Percentage	Valid percentage
18-24	69	56.1%	56.1%
25-34	38	30.9%	30.9
35-44	9	7.3%	7.3%
45-55	7	5.7%	5.7%
Total	123	100%	100%

Table: 2. Sexual Preferences

Sexual preferences	Frequency	Percentage	Valid percentage
Gay	75	61%	61%
Bisexual	31	25.2%	25.2%
Queer	3	2.4%	2.4%
Asexual	8	6.5%	6.5%
Others	6	4.9%	4.9%
Total	123	100%	100%

Table: 3. Highest Level of Education Completed

		Frequency	Percent	Valid percent	
Valid	Less than high school diploma/	5	4.1	4.1	
	High sch/GDE	59	48.0	48.0	
	Associate degree	19	15.4	15.4	
	Some college	14	11.4	11.4	
	Bachelor	18	14.6	14.6	
	Graduate/professionals	8	6.5	6.5	
	Total	123	100.0	100.0	

Table: 4. Participants' Annual Income

Annual income	Frequency	Percentage	Valid percentage
Less than \$15,000	20	16.3%	16.3%
\$16,000 - \$29,000	31	25.2%	25.2%
\$30,000 - \$49,000	9	7.3%	7.3%
\$50,000 - \$69,000	60	48.8%	48.8%
\$70,000 and above	3	2.4%	2.4%
Total	123	100%	100%

Table: 5. PrEP Uptake

PrEP Uptake	Yes	No	Total	Percentage Yes	Percentage No
Currently on PrEP	23	100	123	18.7%	81.3%
Willing to use PrEP for HIV prevention	82	41	123	66.7%	33.3%

Table: 6. Reliability Test Knowledge Variables

Reliability Statistics	
Cronbach's Alpha	N of Items
.697	7

Table: 7. Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	2.628	8	.956

Table: 8. Univariate Logistics Regression for Knowledge

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
Step 1 ^a	Know Mean	1.104	.314	12.360	1	<.001	3.016	1.630	5.580
	Constant	-3.248	1.112	8.534	1	.003	.039		

a. Variable(s) entered on step 1: Know Mean.

Table 15 shows the significance of 0.001 and I rejected the NULL hypothesis. For every 1 unit increase in PrEP

knowledge, the odds of PrEP adoption increased by 3.016 (302%) at 95% CI ranging from 1.630 to 5.580.

Table: 9. Multivariate Analysis

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
Step 1 ^a	Know Mean	.998	.328	9.238	1	.002	2.712	1.425	5.160
	Age	-.081	.244	.110	1	.740	.922	.572	1.488
	Income	.381	.236	2.604	1	.107	1.464	.921	2.328
	Edu	-.024	.168	.021	1	.884	.976	.702	1.357
	Constant	-3.487	1.185	8.660	1	.003	.031		

a. Variable(s) entered on step 1: Knowledge Mean, Age, Income, Edu.

There was association between PrEP knowledge and the adoption of PrEP by African American Gay and Bisexual men at Alpha level of .002 rejecting the NULL hypothesis.

For every unit increase in Knowledge measure the odds of adopting Prep increased by 2.712 OR with CI of 1.425 to 5.166.

DISCUSSION

Knowledge and PrEP Adoption

The coefficient for knowledge is .998, a positive correlation, with a standard error (S.E.) of .328 and Wald statistics value of 9.238 and 1 degree of freedom. The p-value is .002 which is less than .05 demonstrating a statistically significant association between PrEP

knowledge and the adoption of PrEP for HIV prevention among the participants. The odds ratio of 2.712 with a 95% CI ranging from 1.425 to 5.160. This shows that one unit increase in PrEP knowledge increases the odds of adoption of PrEP by 2.712 or 271%. Statistically, age, income, and the level of education are not significant contributors to the relationship between knowledge of PrEP and the decision to adopt PrEP for HIV prevention. My finding also

indicated that the level of participants' education has no relation with their knowledge of PrEP. S Kahle (2018) found the relationship between knowledge and PrEP adoption to be significant among African American gay men with $P=0.005$, $OR=0.56$ at 95% CI [0.34-0.84] (Kahle M.E., 2018). However, he found that the participants with lower education have corresponding lower knowledge of PrEP. This finding may be explained by factors such as the time difference between the two research projects. A lot of awareness may have been created by PrEP makers who continuously advertise their products on news networks and social media, among others. Studies have consistently shown that individuals with higher levels of knowledge about PrEP are more likely to consider and adopt it as part of their HIV prevention strategy (Calabrese, S.K., 2020). The positive coefficient, substantial odds ratio, and statistical significance in the current study align with the broader understanding of the positive impact of knowledge on PrEP adoption. All the works I reviewed validated my finding of strong positive association between PrEP knowledge and adoption by the subject population in other regions of the United States

Limitations of the Study

It's essential to consider potential limitations and nuances in the findings. This study has many limitations. First, the study selection of participants was not randomized which may affect the external validity of the results. Second, participants' self-identification as African American and sexual preferences may be problematic with some concerns for trustworthiness. Third, factors such as the specific context, sample characteristics, and measurement of medical mistrust could contribute to variations in findings across studies. The findings may also underscore the broader social determinants of health, including historical and systemic factors contributing to medical mistrust among marginalized populations. This study may also be limited to people less than 55 years old since most of the participants are within that age group.

RECOMMENDATION

There exists the need to create effective social change, more tailored and effective strategy must be developed to address the specific knowledge gap needs of African American gay and bisexual men in Ohio. They need to understand the unique ability of PrEP to prevent HIV infection, where and how to get it. They must also understand the safety level of the drugs and concerted efforts must be made to allay all their concerns.

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