Adolescent Youth Survey on HIV Prevention in Alabama: Protocol for Community and Online Survey with Bot Detection and Fraud Screening.

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Abstract

Background: In Alabama, the undiagnosed HIV rate is over 20%; youth and young adults, particularly those who identify as sexual and gender minorities, are at elevated risk for HIV acquisition and are the only demographic group in the United States with rising rates of new infections. Adolescence is a period marked by exploration, risk-taking, and learning, making comprehensive sexual health education a high-priority prevention strategy for HIV and sexually transmitted infections. However, in Alabama, school-based sexual health and HIV prevention education is strictly regulated and does not address the unique needs of sexual and gender minority teenagers.

Objective: To understand knowledge gaps related to HIV prevention and pre-exposure prophylaxis, specifically to address these gaps via intervention, we conducted the Alabama Youth Survey to evaluate 14-17 year old of sexual and gender minorities' preferences and knowledge related these topics.

Methods: Between September 2023 and March 2024, we conducted an online survey with 14-17 years old, assigned male at birth, sexually attracted to men youth who lived in Alabama. Half of the study's participants were recruited through community partners, namely the Magic City Acceptance Academy and the Magic City Acceptance Center, and the other half were recruited online via social media. A 7-step fraud and bot detection protocol was implemented and applied to online recruitment to reduce the likelihood of collecting false information.

Results: Analyses are ongoing (N=206). Preliminary results include a sample mean age of 16.21 years (standard deviation = 0.88); about a quarter identified as transgender or gender non-conforming, with 6% stating their gender as a transgender woman. Thirty percent self-reported their race as African American or Black; 12% were Hispanic or Latinx. More than half reported being sexually active in the past six months.

Conclusions: If the study is successful, we will yield information on HIV knowledge, PrEP awareness, PrEP preferences, and related outcomes among sexual and gender minorities teenagers in Alabama, an underserved, hard-to-reach, but also high-priority population for public health efforts to End the HIV Epidemic.

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ABSTRACT

Background: In Alabama, the undiagnosed HIV rate is over 20%; youth and young adults, particularly those who identify as sexual and gender minorities, are at elevated risk for HIV acquisition and are the only demographic group in the United States with rising rates of new infections. Adolescence is a period marked by exploration, risk-taking, and learning, making comprehensive sexual health education a high-priority prevention strategy for HIV and sexually transmitted infections. However, in Alabama, school-based sexual health and HIV prevention education is strictly regulated and does not address the unique needs of sexual and gender minority teenagers.

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Conclusions: If the study is successful, we will yield information on HIV knowledge, PrEP awareness, PrEP preferences, and related outcomes among sexual and gender minorities teenagers in Alabama, an underserved, hard-to-reach, but also high-priority population for public health efforts to End the HIV Epidemic.

Trial Registration: Not Applicable.

Keywords: HIV knowledge; PrEP; Adolescents; Transgender; MSM; South

INTRODUCTION

In Alabama, the undiagnosed human immunodeficiency virus (HIV) rate is over 20%; youth and young adults, particularly those who identify as sexual and gender minorities (SGM) are at elevated risk for HIV acquisition and are the only demographic group in the United States with rising rates of new infections [1, 2]. Adolescence is a period marked by exploration, risk-taking, and learning [3], making comprehensive sexual health education, typically delivered in school systems, a high priority prevention strategy for HIV and sexually transmitted infections (STI) [4]. However, in Alabama, school-based sexual health education is strictly regulated [5]; school-based sexual health education must adopt an abstinence orientation and HIV prevention is typically discussed within the context of heterosexual marriage [6, 7]. In response to these structural limitations, community-based organizations have developed their own sexual health and HIV prevention education programs [8]. However, their content is typically delivered inconsistently, is reliant on the availability of funding, and is offered only to youth engaged in services. In 2019, pre-exposure prophylaxis (PrEP) was established as safe and effective in preventing HIV among adolescent-aged men who have sex with men (MSM), and the United States Food and Drug Administration (FDA) approved PrEP for individuals weighing at least 77 lbs; thereby making it available to adolescents [9, 10]. But, prescribing PrEP to adolescents remains well under ideal levels [11]. Due to the lack of comprehensive HIV prevention and sexual health education in Alabama schools, there are high rates of HIV among SGM youth, and low rates of PrEP uptake. This results in unanswered questions about what adolescents know or do not know about HIV and STIs and about characteristics of their psychosocial which may influence the acceptance of PrEP. Furthermore, new PrEP modalities are being developed, and clinicians and researchers alike are interested in learning about what PrEP options may be more acceptable to adolescents.

While increasing PrEP uptake among young SGM is urgently warranted [12], and federal and local

agencies are supporting behavioral interventions to reach this group [13], adolescent SGM will not engage in HIV biomedical prevention if they do not know about PrEP, PrEP options are not acceptable for their developmental period, or understand their risk [14-16]. There is an unmet need to deliver tailored HIV prevention for diverse SGM youth, built upon adolescents' existing knowledge and preferences [17, 18]. To understand existing knowledge gaps, specifically to address them via intervention, we conducted the Alabama Youth Survey to evaluate 14-17 year old SGMs' preferences and knowledge related to HIV prevention, PrEP, and STIs.

OBJECTIVES

In this study, we aim to elucidate knowledge, beliefs, and preferences related to HIV prevention among SGM adolescents in Alabama through an online survey to inform future intervention development. If this pilot study yields informative results, we will develop or adapt digital health intervention modules [19, 20], a preferred and effective modality for reaching youth, to address PrEP uptake, considering preferences and levels of knowledge.

METHODS

Ethics Approval

All study materials and procedures were reviewed and approved by the University of Alabama at Birmingham (UAB) Institutional Review Board (IRB-300009255) and the Florida State University (FSU) Institutional Review Board (STUDY00003480). Informed assent was collected digitally from all study participants prior to data collection. We received parental waivers from both reviewing IRBs due to the precarious situation of many SGM youth in Alabama, but an information sheet for parents was developed and made available. Study data has been deidentified and stored on a secure server. Study participants received an incentive of a $35 digital gift card payment.

Eligibility Criteria

All potential participants completed a web-based screening survey via Qualtrics for eligibility verification. To be eligible for the study, potential participants must have been 14-17 years old, assigned male at birth, report sexual attraction to men, and live in Alabama. MSM, transgender women, and gender queer individuals were eligible if they met the aforementioned criteria.

Community Partners and Online Recruitment

We partnered with three local agencies for this study. The Magic City Acceptance Academy (MCAA) is the only trauma-informed charter school for LGBTQIA+ in the United States Deep South. MCAA recruitment was supplemented by recruitment from the Magic City Acceptance Center (MCAC) [21, 22]. While both agencies are independent, they have ties to leadership and are connected to Birmingham AIDS Outreach (BAO) [23]. About half of our sample was recruited in-person from these sites. The other half were recruited online via social media, through targeted advertisements on Facebook, Instagram, and Snapchat.

Bot Detection and Data Protection

Fraudulent data and responses are commonplace in online surveys, especially when a monetary incentive is available. Examples of data fraud include, bad actors including eligible individuals who submit surveys multiple times for multiple incentives, ineligible individuals who lie to meet eligibility criteria, and programmed bots. Since half of our sample was recruited online, we employed extensive screening protocols including requiring the 1) answering of three youth-focused qualitative questions that require a typed response that would indicate residence (e.g., What’s your favorite local restaurant?) during screening, 2) multiple ReCAPTCHAs embedded throughout,

review of Qualtrics bot detection, 3) requiring a United States based IP address, 4) locking surveys to disallowing multiple submissions from the same IP address or device, 5) requirement that eligible respondents provided an in-state phone number which was then pinged for SMS verification prior to sharing the survey link, 6) checking that all linked surveys were completed sequentially, indicating proper routing, and 7) Zoom-based verification audits when data seemed suspicious (e.g., two surveys submitted back to back, surveys received from the same small town in Alabama, etc.). We also changed the survey links weekly to avoid improper circulation. These procedures were completed for all participants who were recruited online to ensure data integrity.

Adolescent Survey

The online survey was programmed in Qualtrics to collect data on HIV knowledge, perceived HIV risk, actual HIV risk, PrEP knowledge, preferences related to PrEP modalities, stigmas, and characteristics that are known to be related to HIV prevention among SGM. Some constructs were developed specifically for this study, such as PrEP modality preference, while in other cases, we used validated scales. See Table 1 below for measures. We aimed to recruit 200 participants and were able to recruit N=206 between September 2023 and March 2024.

Table 1: Measures Collected

Construct	Description or Examples	# of Qs
Demographics	Age, Gender, Sex, Race, Ethnicity, Sexual Orientation, Residence in Alabama, Parental Education, Income	10
HIV Risk and Prevention	Sexually Active [24, 25], Injectable Substance Use, on PrEP, Prior STI Diagnosis [26]	10
HIV Knowledge	HIV Knowledge Questionnaire (HIV-KQ-18) [27]	18
STI Knowledge	STI Knowledge Scale [28]	27
Medication Experience and Preferences	Oral Pills, Shots, Suppositories, Patches, etc.	13
PrEP Familiarity	Seen Commercials, Types of PrEP, PrEP Brands	6
PrEP Awareness	PrEP-COL Scale [29]	10
PrEP Preferences	PrEP Modalities, PrEP Delivery Locations, etc.	20

Trusted Sources	Types of Information Sources and People	24
Stigma	Revised Internalized Homophobia Scale (IHP-R) [30] and Everyday Discrimination Scale [31]	14
Depression	Personal Health Questionnaire Depression Scale (PHQ-8) [32]	8
Resilience	MOS Social Support Survey [33], General Self-Efficacy Scale (GSE) [34]	29

Pilot Testing

Study team members aged 20-24 pilot tested the survey multiple times to assess its completion time, which was determined to be about 20-25 minutes, depending on how slowly one reads the questions and the time given to consider response options. We then pilot tested the survey with the first 10 respondents and found similar completion metrics, with no complaints or concerns reported.

Data Storage and Statistical Analysis

Encrypted data is saved on an FSU server with password protection. The database and associated data structures were developed before survey distribution and were not adjusted during the protocol. During data collection, we examined data quality weekly (e.g. missing data, assessment of distributional assumptions, identification of outliers) and will do so before statistical analysis is conducted. As a pilot study, missing scale data will not be estimated. Once data are ready, we will compute frequencies for each measure and for each scale to assess variability and internal reliability. We will construct summary scores of scales, such as HIV and PrEP knowledge, to determine if these have adequate internal consistency (Cronbach $\alpha \geq 0.70$) [35]. Using multivariable logistic regression, we will examine associations between personal characteristics of survey respondents and key constructs. We will use SPSS 29 or SAS 9.4 for quantitative analyses.

RESULTS

While this study was approved in 2021, data collection began in September 2023 and concluded in March 2024. Data analysis is underway. The sample included 206 participants aged 14-17 years with a mean age of 16.21 years (standard deviation, SD=0.88); about a quarter identified as transgender or gender non-conforming, with 6% explicitly stating their gender as a transgender woman. Thirty percent self-reported their race as African American or Black; 12% were Hispanic or Latinx. More than half reported being sexually active in the past six months.

DISCUSSION

In this study, we conducted a survey, with extensive data verification strategies for online recruitment, to inform the adaptation or creation of a sexual health and HIV prevention intervention for SGM adolescents who live in southern states where school-based sexual health education may be unavailable or strictly limited. In this survey, we assessed adolescent SGMs' knowledge, sentiments, and beliefs related to HIV risk, PrEP, and STIs including preferences related to modality of PrEP and PrEP acceptability.

Limitations

While the study team was meticulous in bot detection and other fraud measures, some participants did not receive face-to-face interaction, and thus those recruited online may be different than participants recruited from our local community partners. Secondly, the study may be susceptible to desirability bias, especially from participants who were recruited via in-person venues. While our sample is large for SGM adolescents, a larger sample would increase generalizability. There were

domains that would have been valuable to assess, such as living situation and prior experiences with negative exposures; however, in pilot testing, adolescents felt the survey could not be lengthened.

Conclusions

If the study is successful, we will yield information on the HIV knowledge, PrEP awareness, PrEP preferences, and related outcomes among SGM teenagers in Alabama, an underserved, hard-to-reach, but also high-priority population for public health efforts to End the HIV Epidemic. Data can inform the development of a culturally appropriate (for southern contexts, to be adolescent friendly) modular HIV prevention intervention, targeting behavior change related to HIV prevention uptake for SGM adolescents, that can be seamlessly integrated into amenable school and community settings in the southern United States.

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Author Contributions

HB was the Principal Investigator of the study and lead author. IY is the lead statistician. JB led data collection efforts with the support of CLB and AJ. All co-authors contributed to the writing, revisions, and editing of this manuscript.

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Conflicts of Interest

The authors have no conflicts of interest to disclose.

Data Availability

Data is available upon request via this study's lead author, Dr. Henna Budhwani at hbudhwani@fsu.edu.

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ABBREVIATIONS

BAO – Birmingham AIDS Outreach

FDA – Food and Drug Administration

FSU – Florida State University

HIV – Human Immunodeficiency Virus

MCAA – Magic City Acceptance Academy

MCAC – Magic City Acceptance Center

MSM – Men who have Sex with Men

PrEP – Pre-Exposure Prophylaxis

SGM – Sexual and Gender Minority

STI – Sexually Transmitted Infections

UAB – University of Alabama at Birmingham