HHS Public Access

Author manuscript

Am J Health Promot. Author manuscript; available in PMC 2024 April 19.

Published in final edited form as:

Am J Health Promot. 2020 January ; 34(1): 42–51. doi:10.1177/0890117119865112.

There's an App for That: Using Geo-social Networking Apps to Access Young Black Gay, Bisexual and other MSM at Risk for HIV

Errol L. Fields, MD, PhD, MPH[1,2], **Amanda Long, MSPH**[1], **Derek T. Dangerfield II, PhD**[3], **Anthony Morgan**[1], **Mudia Uzzi, MSc**[1], **Renata Arrington-Sanders, MD, MPH, Sc. M.**[1,2], **Jacky M. Jennings, PhD, MPH**[1,2]

[1]Johns Hopkins University School of Medicine, Baltimore, MD, United States of America

[2]Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, United States of America

[3]Johns Hopkins School of Nursing, Baltimore, MD, United States of America

Abstract

Purpose—Young Black gay, bisexual and other MSM (YBMSM) carry a disproportionate HIV burden in the US. Geo-social networking applications (GSN-apps) are environments that may increase HIV risk among users. This study explored the acceptability and feasibility of using these apps for HIV/STI public health outreach.

Design—Semi-structured in-depth qualitative interviews.

Setting—A frequently reported GSN-app for meeting sex partners by newly diagnosed HIV-infected MSM in Baltimore.

Participants—17 YBMSM age 18–24 (mean=21.5/SD=1.8) who were logged-on to the GSN app in venues or census tracts in high HIV transmission areas.

Methods—Participants completed 60–90 minute semi-structured interviews, which were audio-recorded and transcribed. Interview data were analyzed in NVivo10 using categorical analysis and double-coded until consistency was achieved.

Results—Participants described GSN apps as acceptable and feasible resources for public health practitioners seeking to access YBMSM to provide HIV/STI treatment and prevention services and resources. Three themes emerged: 1) the need to authenticate public health messages to distinguish from spam; 2) improved access to YBMSM including opportunities to identify and access virtual congregations of youth in non-gay-related spaces; and 3) the importance of avoiding stigmatizing YBMSM when targeting sexual health messages.

Conclusion—GSN-apps have great potential as tools for identifying and engaging at-risk YBMSM. Additional work is needed to understand limitations of this medium, to develop

Corresponding Author: Errol L. Fields, Johns Hopkins University School of Medicine, 200 N. Wolfe Street #2027, Baltimore, MD 21287, USA, Errol.Fields@jhmi.edu, Fax: 410-502-5440.

Declaration of Conflicting Interests

The author(s) declared following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: Dr. Fields has served on HIV Prevention and Treatment Advisory Boards for Gilead Sciences.

strategies to engage YBMSM without further stigmatizing them, and to maximize their outreach potential.

Keywords

HIV; STI; men who have sex with men; African American; mobile apps

Purpose

In the U.S., young Black gay, bisexual and other men who have sex with men (YBMSM) are disproportionately affected by HIV and continue to be at significant risk for infection. In 2016, YBMSM experienced 54% of the 6,916 HIV diagnoses among young MSM aged 13–24.[1] Powerful HIV prevention tools such as treatment as prevention (TasP) and pre-exposure prophylaxis (PrEP) hold the potential to curb transmission in YBMSM and eliminate these disparities. Yet difficulty identifying and accessing YBMSM at greatest risk for HIV transmission and acquisition presents significant challenges for prevention.

Poor access to YBMSM at greatest risk by public health practitioners impedes the implementation of effective prevention strategies and contributes to the continued disparity in HIV infection among these youth. Racial HIV disparities among MSM in part reflects increased prevalence of untreated STI's, lower HIV testing rates and later HIV diagnosis among Black MSM compared to other MSM subgroups.[2, 3] These factors are each exacerbated in young MSM which place YBMSM at even greater risk.[4] Similarly low awareness, access to, and uptake of PrEP specifically among young and adult Black MSM[5–7] threatens to widen HIV disparities rather than eliminate them.

Recently, online spaces have increasingly been used by MSM for social and sexual networking[8, 9] especially among young MSM.[10] Geo-social networking apps (GSN-apps) have become particularly popular. Since the launch of the first GSN app *Grindr* in 2009, several others (e.g., *Jack'd*, *Scruff*, *Growlr*, etc.) specific to MSM have been developed and have become widely used for meeting sex partners.[8, 11] From 2010–2015, nomination of internet-based venues as sex partner meeting places in partner services interview (e.g. websites, social media platforms, and geosocial networking [GSN] applications) increased from 21% to 43% among MSM in Baltimore diagnosed with syphilis and/or HIV; GSN-apps specifically increased from 5% to 26% during that time.[9] In 2015, GSN-apps accounted for 60% of all internet-based venues reported by newly diagnosed HIV-infected MSM. These findings suggest that GSN-apps could be virtual spaces connected to ongoing HIV/STI transmission networks, which could place users at risk for acquisition and be important access points for outreach activities prioritizing at-risk populations.

Consistent with these local findings, emerging research on GSN-apps has shown higher HIV-related risk among users including significantly more sexual partners,[11–13] more concurrent partnerships,[12] and higher prevalence of ever being diagnosed with an STI other than HIV.[11] While these studies provide some insight into users of these apps, they have not explored GSN-apps specifically among YBMSM. Despite high mobile internet usage among Blacks,[14] Black MSM have only represented 6.4–25.7% of study populations.[11, 12, 15–17] One study focused exclusively on YBMSM app users and characterized the

utilization patterns, behaviors and characteristics of users but did not explore sexual risk behaviors associated with app use or the feasibility and acceptability of app-based prevention interventions.[18] Some studies have demonstrated acceptability for app-based prevention interventions[15, 19] and feasibility of recruiting individual MSM from GSN-apps for research purposes.[20] However, the studies to-date have not explored the acceptability and feasibility of using these apps for HIV/STI prevention and control activities, particularly among populations that are at increased risk. Therefore, this study engaged YBMSM GSN-app users at potentially increased risk for HIV/STI and explored their perspectives on acceptability and feasibility of using GSN-apps to provide outreach for HIV/STI prevention services such as HIV testing and behavioral counseling.

Methods

Study Design and Population

In-depth, semi-structured qualitative interviews were conducted with 17 YBMSM aged 18–24 years (mean=21, SD=2) between September 2015 and February 2016. Participants were actively recruited while using an eligible GSN-app within an eligible area (i.e., census tract) or sex partner meeting venue. We used a purposive sampling strategy to recruit at-risk YBMSM users of GSN apps potentially connected to HIV/STI transmission networks by recruiting from both a GSN-app and an area associated with HIV/STI transmission. Individual level eligibility for participation criteria included: African American or Black by self-report, aged 18–24 years, reported anal/oral sex with a male partner met on a GSN app in the last 12 months, residing in Baltimore City and English speaking. Details of the strategy for selecting GSN apps and areas are described below.

GSN-app Eligibility Criteria: We selected the GSN-app most frequently nominated as a sex partner meeting place by newly HIV diagnosed MSM. A description of this data has been provided previously in detail;[21, 22] briefly, we used local city health department public health surveillance data from October 2012 through December 2014 of MSM newly diagnosed with HIV living in Baltimore City. Cases were considered to be MSM if during the partner services interview they self-identified as gay/bisexual or reported having sex with men. New diagnoses are routinely defined as no prior report of HIV infection in either the BCHD's HIV/STI morbidity registry or Maryland's Department of Health's (MDH) Enhanced HIV/AIDS Reporting System database (eHARS). As part of partner services interview, individuals are asked to nominate sex partner meeting places (i.e. physical and online locations where they have meeting sex partners). Data were limited to cases with interview records and information on at least one sex partner meeting place. A frequency list of GSN apps was generated including six GSN apps nominated 54 times. This list was rank ordered and the most frequently report GSN-app was selected including 35.2% (19) of all nominations.

Area Eligibility Criteria: Participants were recruited while signed on to a selected GSN app in one of two scenarios: 1) attending a sex partner meeting venues characterized as club or bar with a high venue viral load (i.e. an aggregation of the viral load at diagnosis of individuals who report meeting partners at that venue), which was highly nominated by

Black or African American MSM, and 2) within a census tract with a high community viral load and predominantly Black or African American residents. These criteria were selected to prioritize recruiting of YBMSM in high HIV transmission areas.

We used the following strategies for identifying census tracts; these methods have been described previously.[21] HIV public health surveillance data from October 2012 to December 2014 for Baltimore City was obtained from the city health department including 13,773 HIV positive individuals. Among these, 12,561 (91.2%) had a residential address that could be geocoded to a city census tract (n=199 of 200). Among the 12,561 cases, 7,830 (62.3%) had a reported viral load. Per CDC guidelines, all VLs below the lower limit of detection for a given test were assigned a value corresponding to one half the lower detection limit and if an individual had multiple viral load tests during the study period, the most recent value was used.[23, 24] Community viral load (CVL) measure was generated by census tract by calculating the geometric mean of all persons with a viral load living in that census tract. Census tracts with a CVL above 1500 copies/mL were defined as high CVL areas.[22, 25, 26] The cut-off of 1500 copies/mL was chosen based on work by Quinn, et al. (2000) showing no transmission events among discordant couples where the HIV positive individual had a viral load below 1500 copies/mL[27]. We selected for recruitment the seven census tracts which met criteria for high CVL and with a population of greater than 75% Black or African American.

We used the following strategies for identifying sex partner meeting venues. In a similar approach as that used to identify high CVL areas, we utilized the viral load data to calculate a sex partner meeting venue viral load. Specifically, venue viral load was calculated as the geometric mean viral load of cases that reported meeting a sex partner at a particular venue. Venues were with a venue viral load above 1500 copies/mL were defined as high venue viral load venues. We selected the three venues that were classified as high venue viral load and highly nominated among Black/African American gay, bisexual and other MSM.

Recruitment Process: Participants eligible for recruitment had to be logged onto the selected GSN-app in one of the seven census tracts or one of the three venues. The selected tracts and venues were randomly assigned to the following recruitment time periods selected based on prior findings about popular GSN utilization times: 10a-2p, 4p-8p, 10p-2a, and 4a-8a[28]. Active recruitment was conducted on the selected GSN-apps within selected tracts and venues. Research assistants (RA) travelled in pairs to the recruiting site (e.g. to the geographic center of the census tract or inside the venue). RAs logged onto the GSN app using profiles created for the study. These profiles included study fliers with study information and eligibility criteria. GSN users self-identifying as Black/African-American and between 18–24 years were sent direct messages within a one-mile radius or independently contacted the RA. An IRB approved, standardized script was used to contact and communicate with men about the study through the direct message (DM) function within the app. This script, rather than unstructured or informal messages, was required by the IRB. YBMSM interested in the study worked with the RA to complete an in-depth interview through the DMs or scheduled an interview for another time. Two hundred seven individuals were sent a direct message to recruit them for the study. Approximately 1/3 (71) responded to the initial direct message and 86% of these individuals (n=61) responded

with interest in participating. There were no significant differences with respect to age or time of contact between those who responded compared to those who did not respond. Of those interested, 66.7% (n=40) completed the eligibility screen; RAs attempted to screen the remaining interested individuals but they did not answer all of the screening questions and stopped responding to DMs. 29.5% (n=18) were eligible for the study and 28.3% (n=17) completed the study (see Figure 1) Ineligibility was primarily due to age greater than 24 or no sexual activity in the past 12 months.

Qualitative Data Collection

A self-identified Black gay researcher conducted 1–2 hour in-depth, semi-structured interviews with participants. We developed the interview guide based on previously published data and investigators' past work with the study population.[8, 12, 29] The guide was designed to explore participant utilization patterns, sex partner selection, sexual networks, sexual behavior, risk perceptions and risk mitigation strategies, and feasibility and acceptability of outreach by public health professionals for sexual health promotion (the focus of the current study).

Following interviews, participants completed a brief survey about socio-demographic characteristics, recent sexual encounters and past HIV/STI testing history. Participants were compensated for their time with a $50 gift card following completion of the interview. The Johns Hopkins School of Medicine Institutional Review Board approved the study and participants completed informed consent prior to interviews and brief survey.

Qualitative Analysis

Interviews were audio-recorded and transcribed verbatim. We used the constant comparative method of grounded theory to analyze interview data.[30]We conducted categorical analysis using the qualitative data analysis software NVivo to explore acceptability and feasibility of HIV/STI prevention related public health outreach via apps to YBMSM users. We used a 3-stage analytic coding strategy that included open coding (examining transcripts for salient categories or codes), axial coding (identifying relationships between codes), and selective coding (identifying a core category integrating axial codes).[31] Transcripts were fractured into discrete segments, which were sorted into categories and coded, thus facilitating a comparative examination across participants of acceptability attitudes and feasibility of public health outreach. Codes related to public health messaging and outreach were identified through open coding and data immersion.

Through axial coding, a three-tiered coding hierarchy was developed based on categories that emerged during the open coding process performed by the first author. The first author then developed a codebook with codes organized according to this hierarchy and trained two members of the research staff on the completed codebook, the second (AL) and fourth authors (MU). We used stepwise replication to improve the dependability of the coding process.[32, 33] These two coders double-coded 20% of the transcripts to establish inter-rater reliability based on the following axial codes/categories that emerged from the analysis: reasons for initial and current use, utilization patterns, perceptions of illegitimacy, safety/comfort concerns, underage use, relationship to other venue types, and acceptability of

public health outreach. Differences in coding were discussed between the first, the second and fourth authors until a consensus was reached. After establishing agreement, AL and MU completed the remaining transcripts.

For selective coding, the final stage of coding, the three coders identified a core category that related to all the previously identified codes and was relevant to the research question. We identified this core concept by writing memos throughout the coding process including descriptions of recurring themes, possible relationships among major categories and comparisons across the variation in participants' responses to questions or expressions of phenomena relevant to the research question.

Results

Demographic Characteristics

We recruited a participant population (n=17) aged 18–24 (mean=21, SD=2) (see Table 1 for additional characteristics).

Emerging Themes

Participants described GSN-apps as multipurpose tools used for a variety of interpersonal interactions (e.g. dating, finding community, transactional etc.); often frequently used throughout the day by each user, used by commonly described hard to reach populations (e.g. YBMSM, men who do not frequent gay-identified physical venues; and often characterized by fraudulent or other illegitimate activity by other users (e.g. scams, spam, solicitations). Themes related to the acceptability and feasibility of using these apps for public health outreach that emerged from these descriptions focused on 1) reaching young populations, 2) opportunities for improved reach and access YBMSM, and 3) acceptability and feasibility of specific engagement strategies. These themes are illustrated below using participant quotations. Direct quotations are listed by number in Table 2.

Reaching young populations: Participant descriptions of their own use and their characterizations of GSN-apps, suggested these apps might provide increased opportunities to reach populations that are younger and less knowledgeable about HIV risk. Many described GSN-apps as their first introduction to the "gay community" and same-sex partners (Quote 1) which they often accessed in their early or middle teenage years (Quote 2). Participants described users under 18 years old as common on GSN-apps (Quote 3) but also naïve, often unaware of the potential risk of meeting partners in this space (Quote 4), and unaware of sexual and reproductive health resources available to them (Quote 5).

Improved reach and access: GSN-apps may also provide more opportunities to reach users compared to more traditional, physical social venues used for public health outreach. Similar to utilization patterns of other social networking mobile apps (e.g. Instagram, Facebook)[34] many participants reported frequent engagement with the application, multiple times per day (Quote 6, Quote 7). Participants also described using apps during otherwise idle times, i.e. while not actively engaged in another competing activity.

GSN-apps may also provide access to subgroups of gay, bisexual or other men who have sex with men who do not frequent gay-related social venues, may congregate in areas not typically accessed during public health outreach or are otherwise hard to reach. Participants described using GSN-apps in social venues that were not previously identified as gay-related to meet potential partners in these spaces (Quote 8). Participants also described seeing "new boys" or men on GSN-apps who they had not seen before. One young man using terms to describe hyper-masculine and often non gay-identified men illustrated this point with his experience on a particular app; "I swear to God once you see that [GSN app name] you see trade boys, you see boys in the hood, boys you never seen. You see all that." Participants also described logging on to GSN-apps in popular areas of the city where more men tend to be logged on. This virtual congregation of users was noted in specific geographic areas or places in the city not typically thought of as gay-related spaces (Quote 9) which may otherwise not be targeted for traditional public health outreach.

Engagement strategies: Overall, participants agreed that feasible and acceptable strategies for public health outreach included indirect and passive communication, such as banners or pop-up advertisements that provide resources and information regarding local services or prevention information (Quote 10). Some participants recalled seeing flyers about events or other resources and felt that public health messaging would fit within this existing communication structure (Quote 11). Even if users do not actively click on these ads, one participant noted users might subconsciously note the information and remember details about the program (Quote 12).

Many also agreed with using GSN-apps for direct communication about HIV and/or STI exposure, with some participants finding it helpful because it removed any potentially awkward personal interactions with recent sexual partners and may increase the likelihood of those exposed being tested and treated (Quote 13). Participants also discussed the acceptability of direct communication for research recruitment and found it acceptable once they had information about the research study and requirements (Quote 14).

Some participants objected to any messaging, especially direct communication that assumed risk based on demographic characteristics – including age, race or sexual identity. These participants agreed that it would be unacceptable to target certain groups for outreach messages based on specific demographics or risk characteristics indicated within user profiles (Quote 15).

A recurrent theme throughout the interviews was the fraudulent or otherwise illegitimate activity encountered on the apps (Quote 16). This perception of illegitimacy may be a barrier to using direct or indirect communication as a strategy for engaging app users. Participants concerned about potentially encountering a "scam," often described wariness about messages they received or advertisements they encountered (Quote 17). While most participants like the idea of a representative from the health department communicating a potential HIV/STI exposure through a DM on a GSN app (e.g. if a sex partner provided their screenname to the health department during a partner services interview), one participant felt that being approached on the app would lack the legitimacy and gravity of the more traditional communication strategies health departments typically employ (Quote 18).

Discussion

Overall participant perspectives endorsed GSN-apps as an acceptable and feasible resource for public health practitioners seeking to access YBMSM to provide sexual health resources and HIV/STI treatment and prevention services. Our findings are consistent with previous literature which described increased access to younger populations on GSN-apps compared to other venues[35] and user interface with GSN-apps multiple times a day which potentially provides multiple engagement opportunities.[28] In addition, these data reveal three novel concepts and caveats to the acceptability of this approach for this population: 1) the need to authenticate public health messages to distinguish them from spam, fraudulent and illegitimate messages; 2) improved access beyond gay-related social spaces including opportunities to identify and access virtual congregations of men in geographic areas not previously identified as gay-related spaces; and 3) the importance of avoiding stigmatizing YBMSM by solely using race or other demographic characteristics to target communications about HIV/STI risk.

As GSN-apps and other social media platforms continue to increase in popularity and daily utilization, commercial advertising and marketing will increasingly be integrated into these settings. While there have been some studies that have described how public health messages fare relative to commercial advertising[36, 37] and spam on social media in general, there has been little attention focused on how sexual health promotion messages are received on GSN-apps. Similarly, data is limited on how these messages in online spaces compare to similar messages in other media (e.g. print, television, etc.) and more traditional forms of public health outreach and disease intervention including in person partner services and contact tracing. Our findings highlight the importance of studying these comparisons. While most of our study participants found direct or indirect public health messaging on GSN-apps acceptable, it was also commonly noted that these messages would be competing with spam or other commercial advertisements.

Prior studies have described the opportunity to access new populations of men who have sex with men on GSN-apps.[38] One study also used GSN-apps to identify the population density of users in a particular geographic area.[39] Our findings where participants describe congregating in geographic spaces to virtually access other men in those spaces builds on this prior work. These findings suggest that both the density of users in an area and the movement of men within and through dense areas is important to understand to adequately identify and characterize areas that influence HIV transmission dynamics. Both outreach and surveillance have traditionally been tied to physical and fixed locations. However, with the movement in geographic and online spaces described by our participants, indicators of high transmission that are fixed in space such as community viral load may not adequately capture how and where transmission is occurring.

This finding also extends the prior work that has described lower likelihood of Black MSM, compared to peers of other races/ethnicities, to congregate in gay-related spaces.[40] The reasons posited for this difference include lower gay-identity among some Black MSM,[41] and discrimination within mainstream gay-related spaces that make some Black MSM feel unwelcome.[40] While many GSN apps are gay-related virtual spaces, YBMSM use of these

apps outside of gay-related physical spaces to identify other MSM, suggests they may be using them in a social context that reflects less affiliation with gay-related physical spaces and locations. This finding has important implications for messaging directed towards YBMSM in these spaces, particularly those young men who may have less connection with gay identity or gay specific messages.

Tailoring or segmenting public health messages by race/ethnicity or other characteristics is often a strategy to address racial or other demographic disparities in health outcomes. While there a lack of data whether or not tailoring messages reduces health disparities,[42] tailored or segmented messages are more likely than general messages to affect individual behavior change.[42, 43] Our findings suggest, however, that tailoring or segmenting sexual health messages to individuals based solely on race or sexual identity may stigmatize and alienate target populations rather than promoting behavior change. This may be particularly true for our study population who already experience stigma related to their race and sexual identity.[19, 44] More research is needed to determine how to design and tailor HIV/STI prevention messages on GSN and other online venues that are effective at engaging YBMSM without further stigmatizing them.

This study has limitations. We were able to access, through our purposive sampling strategy, a high-risk study population. However, sending direct messages about a research study to potential participants, may have increased sample bias towards individuals amenable to non-social or non-sexual inquiries. The low response rate, while likely related to restrictions in the procedures RAs were required to use when communicating by direct messaging, also suggests that there may be both feasibility and acceptability challenges with app-based outreach we were unable to assess with our study population.

We found that these spaces offer the opportunity to access younger populations of gay, bisexual and other MSM; however, we were not able to engage populations under 18 in this study due to the ethical complications of recruiting minors in spaces they may legally be prohibited from using. Youth over the age of 18 spoke in hindsight about the utility of these spaces for reaching their younger selves and minors currently using these spaces, but the voices of these minor youth were missing from this analysis. This limitation is not unique to this study, but is related to the ethical, legal and logistical challenges of engaging youth – especially marginalized youth – in research.[45]

The limitations of qualitative research also apply. Our findings provide important insights into how to access youth in these online spaces. However, sampling was also limited to one GSN app in a single metropolitan area so these findings may not extend to YBMSM using other apps or in other cities. Our goal here was to inform public health surveillance and outreach locally. As such, these findings are nevertheless especially important for Baltimore which has both a significant HIV/STI epidemic and significant disparities affecting YBMSM.

Conclusions

A large body of evidence suggests that places such as social and sexual meeting places are associated with HIV/STI transmission and represent important access points for MSM. With the explosion of internet based social and sexual sex partner meeting places in the past ten years especially for younger MSM, internet sites represent key places for public health outreach. For YBMSM, who may be difficult to reach by traditional outreach strategies and whose HIV/STI risk is associated with their sexual networks, GSN-apps can be an important tool for accessing those at increased risk. Our study findings suggest that geosocial networking apps are an acceptable and feasible space for conducting outreach to YBMSM with important advantages over traditional outreach strategies. Public health outreach messaging for HIV/STI prevention must be developed with these youth, however, to ensure these messages are acceptable to this priority population.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: research was supported by the following grants, JHU Center for AIDS Research NIAID P30AI094189, CDC Minority HIV/AIDS Research Initiative U01 PS 005115, and CDC Category C Demonstration Project PS12-1201.

References

1. CDC.gov. HIV Surveillance – Men WhoHave Sex with Men (MSM) through 2016. Available at: https://www.cdc.gov/hiv/pdf/library/slidesets/cdc-hiv-surveillance-slides-msm-2016.pdf. Accessed April 18, 2018.
2. Millett GA, Flores SA, Peterson JL, Bakeman R. Explaining disparities in HIV infection among black and white men who have sex with men: a meta-analysis of HIV risk behaviors. Aids. 2007;21(15):2083–2091. [PubMed: 17885299]
3. Oster AM, Wiegand RE, Sionean C, et al. Understanding disparities in HIV infection between black and white MSM in the United States. AIDS. 2011;25(8):1103–1112 1110.1097/QAD.1100b1013e3283471efa. [PubMed: 21505305]
4. Agwu A, Ellen J. Rising rates of HIV infection among young US men who have sex with men. The Pediatric infectious disease journal. 2009;28(7):633–634. [PubMed: 19561426]
5. Bush S, Magnuson D, Rawlings MK, Hawkins T, McCallister S, Mera Giler R. Racial characteristics of FTC/TDF for pre-exposure prophylaxis (PrEP) users in the US. ASM Microbe/ICAAC. 2016.
6. Arrington-Sanders R, Morgan A, Oidtman J, Qian I, Celentano D, Beyrer C. A medical care missed opportunity: preexposure prophylaxis and young black men who have sex with men. Journal of Adolescent Health. 2016;59(6):725–728.
7. Strauss BB, Greene GJ, Phillips G, et al. Exploring Patterns of Awareness and Use of HIV Pre-Exposure Prophylaxis Among Young Men Who Have Sex with Men. AIDS and Behavior. May 01 2017;21(5):1288–1298. [PubMed: 27401537]
8. Grov C, Breslow AS, Newcomb ME, Rosenberger JG, Bauermeister JA. Gay and Bisexual Men's Use of the Internet: Research from the 1990s through 2013. The Journal of Sex Research. 2014;51(4):390–409. [PubMed: 24754360]
9. Jennings JM, Reilly ML, Perin J, et al. Sex partner meeting places over time among newly HIV diagnosed men who have sex with men (MSM) in Baltimore, Maryland. Sexually transmitted diseases. 2015;42(10):549. [PubMed: 26372926]
10. Rice E, Monro W, Barman-Adhikari A, Young SD. Internet use, social networking, and HIV/AIDS risk for homeless adolescents. Journal of Adolescent Health. 2010;47(6):610–613.

11. Lehmiller JJ, Ioerger M. Social Networking Smartphone Applications and Sexual Health Outcomes among Men Who Have Sex with Men. PloS one. 2014;9(1):e86603. [PubMed: 24466166]
12. Phillips II G, Magnus M, Kuo I, et al. Use of Geosocial Networking (GSN) Mobile Phone Applications to Find Men for Sex by Men Who Have Sex with Men (MSM) in Washington, DC. AIDS and Behavior. 2014:1–8. [PubMed: 23321946]
13. Rice E, Holloway I, Winetrobe H, et al. Sex risk among young men who have sex with men who use Grindr, a smartphone geosocial networking application. Journal of AIDS and Clinical Research. 2012(Suppl. 4).
14. Lenhart A, Purcell K, Smith A, Zickuhr K. Social media and mobile internet use among teens and young adults. Available at: http://pewinternet.org/Reports/2010/Social-Media-and-Young-Adults.aspx.. Accessed September 30, 2014.
15. Holloway IW, Rice E, Gibbs J, Winetrobe H, Dunlap S, Rhoades H. Acceptability of smartphone application-based HIV prevention among young men who have sex with men. AIDS and Behavior. 2014;18(2):285–296. [PubMed: 24292281]
16. Rendina HJ, Jimenez RH, Grov C, Ventuneac A, Parsons JT. Patterns of lifetime and recent HIV testing among men who have sex with men in New York City who use Grindr. AIDS and Behavior. 2014;18(1):41–49. [PubMed: 23925515]
17. Rice E, Holloway I, Winetrobe H, et al. Sex risk among young men who have sex with men who use Grindr, a smartphone geosocial networking application. Journal of AIDS & Clinical Research. 2012.
18. Duncan DT, Park SH, Hambrick HR, et al. Characterizing Geosocial-Networking App Use Among Young Black Men Who Have Sex With Men: A Multi-City Cross-Sectional Survey in the Southern United States. JMIR mHealth and uHealth. 2018;6(6).
19. Holloway IW, Winder TJ, Lea III CH, Tan D, Boyd D, Novak D. Technology use and preferences for mobile phone–based hiv prevention and treatment among black young men who have sex with men: exploratory research. JMIR mHealth and uHealth. 2017;5(4).
20. Burrell ER, Pines HA, Robbie E, et al. Use of the location-based social networking application GRINDR as a recruitment tool in rectal microbicide development research. AIDS and Behavior. 2012;16(7):1816–1820. [PubMed: 22851153]
21. Jennings JM, Schumacher C, Perin J, et al. A Pilot Study to Increase the Efficiency of HIV Outreach Testing Through the Use of Timely and Geolocated HIV Viral Load Surveillance Data. Sexually transmitted diseases. 2018;45(3):207. [PubMed: 29420450]
22. Brantley M, Schumacher C, Fields EL, et al. The network structure of sex partner meeting places reported by HIV-infected MSM: Opportunities for HIV targeted control. Social Science & Medicine. 2017;182:20–29. [PubMed: 28411524]
23. Centers for Disease Control and Prevention. Guidance on Community Viral Load: A Family of Measures, Definitions, and Method for Calculation 2011.
24. Krieger N, Waterman PD, Chen JT, Soobader M-J, Subramanian S. Monitoring socioeconomic inequalities in sexually transmitted infections, tuberculosis, and violence: geocoding and choice of area-based socioeconomic measures—the public health disparities geocoding project (US). Public health reports. 2016.
25. Jennings JM, Schumacher C, Perin J, et al. A Pilot Study to Increase the Efficiency of HIV Outreach Testing Through the Use of Timely and Geolocated HIV Viral Load Surveillance Data. Sex Transm Dis. Mar 2018;45(3):207–211. [PubMed: 29420450]
26. Safi AG, Perin J, Mantsios A, Schumacher C, Chaulk CP, Jennings JM. Public Health Detailing to Increase Routine HIV Screening in Baltimore, Maryland: Satisfaction, Feasibility, and Effectiveness. Public Health Reports. 2017;132(6):609–616. [PubMed: 29045797]
27. Quinn TC, Wawer MJ, Sewankambo N, et al. Viral load and heterosexual transmission of human immunodeficiency virus type 1. New England journal of medicine. 2000;342(13):921–929. [PubMed: 10738050]
28. Goedel WC, Duncan DT. G. JMIR public health and surveillance. 2015;1(1).
29. Fields EL, Bogart LM, Smith KC, Malebranche DJ, Ellen J, Schuster MA. HIV risk and perceptions of masculinity among young black men who have sex with men. Journal of Adolescent Health. 2012;50(3):296–303.

30. Glaser BG, Strauss AL. The discovery ofgrounded theory: Strategiesfor qualitative research. Chicago: Aldire. 1967.
31. Corbin J, Strauss A, Strauss AL. Basics of qualitative research: Sage; 2014.
32. Guba EG, Lincoln YS. Fourth generation evaluation: Sage; 1989.
33. Morse JM. Critical analysis of strategies for determining rigor in qualitative inquiry. Qualitative health research. 2015;25(9):1212–1222. [PubMed: 26184336]
34. Böhmer M, Hecht B, Schöning J, Krüger A, Bauer G. Falling asleep with Angry Birds, Facebook and Kindle: a large scale study on mobile application usage. Paper presented at: Proceedings of the 13th international conference on Human computer interaction with mobile devices and services, 2011.
35. Grosskopf NA, LeVasseur MT, Glaser DB. Use of the Internet and mobile-based "apps" for sex-seeking among men who have sex with men in New York City. Am J Mens Health. Nov 2014;8(6):510–520. [PubMed: 24658284]
36. Serrano WC, Chren M-M, Resneck JS, Aji NN, Pagoto S, Linos E. Online advertising for cancer prevention: Google ads and tanning beds. JAMA dermatology. 2016;152(1):101–102. [PubMed: 26444220]
37. Sanders A, Robinson C, Taylor SC, et al. Using a Media Campaign to Increase Engagement With a Mobile-Based Youth Smoking Cessation Program. American Journal of Health Promotion. 2018;32(5):1273–1279. [PubMed: 28925292]
38. Huang E, Marlin RW, Young SD, Medline A, Klausner JD. Using Grindr, a Smartphone Social-Networking Application, to Increase HIV Self-Testing Among Black and Latino Men Who Have Sex With Men in Los Angeles, 2014. AIDS Education and Prevention. 2016/08/01 2016;28(4):341–350. [PubMed: 27427928]
39. Delaney KP, Kramer MR, Waller LA, Flanders WD, Sullivan PS. Using a geolocation social networking application to calculate the population density of sex-seeking gay men for research and prevention services. Journal of medical Internet research. 2014;16(11).
40. Han C-s. They don't want to cruise your type: Gay men of color and the racial politics of exclusion. Social Identities. 2007;13(1):51–67.
41. Malebranche DJ, Fields EL, Bryant LO, Harper SR. Masculine socialization and sexual risk behaviors among Black men who have sex with men: A qualitative exploration. Men and masculinities. 2009;12(1):90–112.
42. Hornik RC, Ramirez AS. Racial/Ethnic Disparities and Segmentation in Communication Campaigns. American Behavioral Scientist. 2006/02/01 2006;49(6):868–884.
43. Guttman N, Salmon CT. Guilt, fear, stigma and knowledge gaps: ethical issues in public health communication interventions. Bioethics. 2004;18(6):531–552. [PubMed: 15580723]
44. Arnold EA, Rebchook GM, Kegeles SM. 'Triply cursed': racism, homophobia and HIV-related stigma are barriers to regular HIV testing, treatment adherence and disclosure among young Black gay men. Culture, health & sexuality. 2014;16(6):710–722.
45. Pettifor A, Bekker L-G, Hosek S, et al. Preventing HIV among young people: research priorities for the future. Journal of acquired immune deficiency syndromes (1999). 2013;63(0 2):S155. [PubMed: 23764629]

So What?

What is already known on this topic?

GSN-apps are widely used among young MSM, including young Black MSM (YBMSM), for sexual networking; there is evidence of higher HIV-related risk among GSN-app users. Some studies have demonstrated acceptability for app-based prevention interventions. However, studies to-date have not explored the acceptability and feasibility of using GSN-apps for HIV/STI prevention outreach; YBMSM perspectives have been limited.

What does this article add?

Three novel concepts about using GSN-apps for HIV/STI prevention outreach to YBMSM are described: 1) need to authenticate public health messages to distinguish from spam; 2) improved access to YBMSM including opportunities to identify and access virtual congregations of youth in non-gay-related spaces; and 3) importance of avoiding stigmatizing YBMSM when targeting sexual health messages.

What are the implications for health promotion practice or research?

GSN-apps can be an important tool for accessing at-risk YBMSM with important advantages over traditional outreach strategies. Outreach messaging for HIV/STI prevention must be developed with these youth to ensure these messages are acceptable to this priority population.

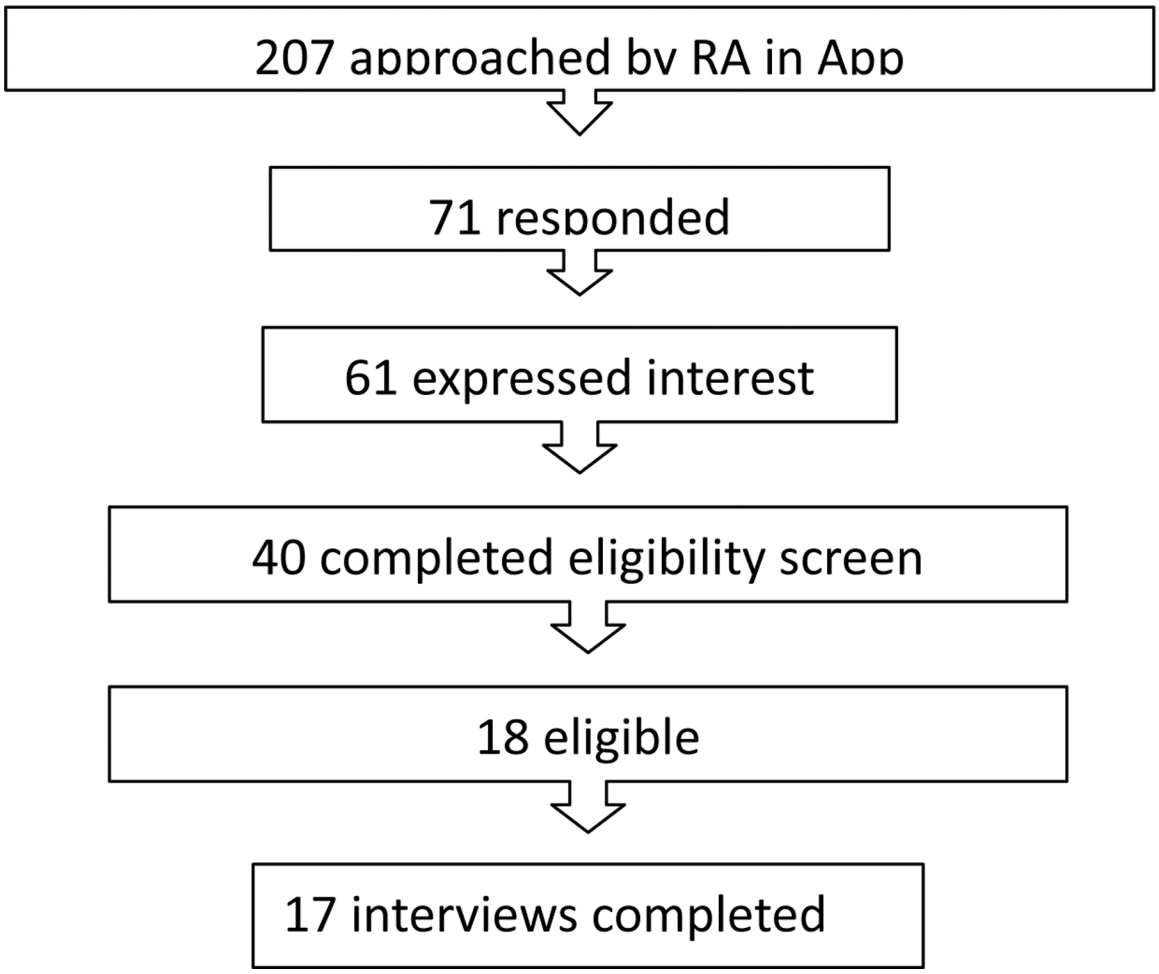

Figure 1:
Participant Response Rate

Table 1:

Demographic and risk behavior characteristics of study participants (N=17)

Characteristic	N	%
Age	Range 18–24; Mean=21.41, SD2.06	
Sexual Identity		
Gay/Homosexual	**16**	**94**
Bisexual	**1**	**6**
Education		
Some high school	**1**	**6**
High School or GED	**6**	**35**
Some College	**8**	**47**
College Degree	**2**	**12**
Employment		
Full time	**10**	**59**
Part time	**2**	**12**
Not working	**5**	**29**
Income		
Less than 10,000	**6**	**35**
10,000–29,999	**5**	**29**
30,000–49,999	**5**	**29**
Greater than 50,000	**1**	**6**
HIV Status		
Negative	**13**	**76**
Positive	**3**	**18**
Unknown	**1**	**6**
HIV Testing Behavior		
HIV test last Year	**13**	**76**
HIV test last 1–2 years	**3**	**18**
Never tested	**1**	**6**
STI Diagnosis last year		
0	**12**	**71**
1–2	**3**	**18**
3 or more	**2**	**12**
Number of sex partners met on recruited GSN app in past 30 days		
0	**2**	**12**
1–2	**10**	**59**
3–5	**4**	**24**
Greater than 5	**1**	**6**

Table 2:

Themes and quotes from participant interviews

Theme	Representative quote
Reaching young populations	
Young, unaware and underage users	1. I got certain friends, a few friends that's on that website and just not telling nobody what they got and they just on that website doing what they want. And nowadays, that's coming in. There's so many young people that's coming on this website, 17, 14, 16, and they not knowing.- 22 year old
Underage users	2. I was young you know. I was only about like probably like 16, 16.. 16, 17 years of age. When I first started using it.- 24 year old 3. You know, now from the new age that's coming in now, it's a lot of young individuals online, that's probably about like 16, 18… needs to be, you know… like probably don't even need to be on [GSN app name] because they just don't need to be.. "You too young".- 24 year old 4. Okay. So, the 17, 16, etcetera, these are folks who don't know to ask to wear condoms. They just get naked.- 22 year old 5. I would just say in general, the education is low for the STDs.−23 year old
Improved reach and access	
Time spent on application	6. Well, this is really bad, but I'm probably on there, like, every day. I'm not looking to have sex every day, but I pull up the app almost every day to either just, like, look on the radar thing, who's around me, or if I'm, like, outside, you know, who's gay in this building or whatever…I'll be on there throughout the day, but I won't sit on there for hours looking. I'll get on there for, like, five minutes and then I'll just get bored or I won't see anybody who I think is cute or whatever and I'll just close it and get on later or something. −18 year old 7. *Q: How much time would you say you spend on [GSN app name]?* A: A lot. *Q: What's a lot?* A: Every time I check my phone, I check my [GSN app name], my Instagram, you know, my messages, my phone, my email. −24 year old
Locations where users log in	8. Just to actually see if it's someone that I know that's out. I mean, it's a good way to see who is in the area besides-- I mean, [GSN app name] is actually starting to do that too, tell you who is close by you, but [GSN app name], it makes sure that you see who else is gay and if you know them or not and how close are they to you, and then you can actually meet up with them and be like "Hey, I was on there too."- 22 year old 9. Well, I know certain areas are very popular with men-- especially within the city. I'll do each area. West Baltimore I'll say like near [mall name] and [public transit station name] or on the east side [around] [university name]. Popular areas that have landmarks that people know about.−20 year old
Acceptable and Unacceptable Engagement strategies	
Banner or pop-up advertisements	10. It's pretty cool and, I mean, the apps already tell you before you-- well, it gives you, like, popups. Tells you about getting tested and stuff and-- but it's good though. It's, like, I mean, if they could, like, give out, like, suggestions and stuff to people.−22 year old 11. It's not my first time. It's my first time for research, but it's normally like people advertise like, "Hey, come here. Get tested. And you'll get a $20 gift card." That's why I was just like, "I get paid for this." And so it's not uncommon for me at least. −23 year old 12. Yeah, I didn't even know there was a ball coming up, and it was on there, and it was like Baltimore Free Ball or it's like this club night or something like that, so, I mean, I know I pay attention, but I think people do pay attention even subconsciously. If you continue to look at something over and over and over it's naturally going to be in your mind, so if you see stuff popping up on "You can get condoms here" or "You can get tested here" when those situations come you're like "You know, I think I saw something on [GSN app name] about it." So I think that it's a good idea. −23 year old
Direct communication	*13. Q: How would you feel if the health department contacted you through [GSN app name] about an STI exposure?* Oh, that would be crazy, but, I mean, it would be welcome… That would be really good, yeah, because a lot of guys I feel like maybe they would be embarrassed or ashamed or whatever, so they wouldn't want to make that call or just send that text and let you know "Hey, I recently found out I was exposed to this. We've had sex recently. You should go get tested." So it can just be completely foolproof. −24 year old
Recruitment of research	14. *Q: What was it like to be approached about a study on [GSN app name]?* Well with that-- because I always thought that was an advertisement, so I ignored it… but after a while, I kept getting messages from it and I looked into it deeper and the picture and that's where I saw the background of all this and all that. So after a while, I finally got into it, I'm like, "Okay, where is that? Where can I do it?" −20 year old

Am J Health Promot. Author manuscript; available in PMC 2024 April 19.

Theme	Representative quote
Direct communication based on demographic characteristics/risk groups	15. Do I think it's a good way to reach other people? Yes. Do I think they're going to be readily available to receive that information? They're sure not. Because young gay men are going to think you think I have HIV because I'm a young and gay so that's why you're sending me this…it's about the way you approach it. You can't talk to somebody and then say, "Hey, here's this HIV prevention website that I'm doing." It's kind of like are you hitting me up because you thought I had HIV? Or you thought I'm at a higher risk than anybody else. −24 year old
Competition with fraudulent activity, spams and other advertisements	
Perceptions of fraudulent activity	16. Because I don't know them people. You not about to chop my ass up in little bitty mother fucking pieces. <laughs> I don't trust people. I just don't. Especially in Baltimore City. And I have had a friend go to a guy's house and his family were really, really, homophobic, and he had to deal with that. I'm not dealing with that. You can get your ass a bus card, whatever you have to do and come to me. −21 year old
Fear of scams or false advertising	17. *Q: Okay, how did it sound like it was a hack?* A: Like it was an ad for like a free iPhone for 100 dollars or something like that. I also have Instagram so like that is very common. Some guys on [GSN app name] are scammers so you'll get hit up occasionally with the occasional, "Oh, you wanna make money overnight?" And it'll be like a bank hack. Some guys are like that and they are on [GSN app name]. −19 year old
Need for authentication of public health messages	18. You calling me, you come to my house. So, you ain't going to hit me up on [GSN app name]. I have a problems with that. Why you hitting me on [GSN app name]? You the Health Department…Like how you think that's going to work? You the Health Department, come to my house. Make me feel like this shit is dangerous. [Make] me feel like oh bitch, you better get your shit together. Don't hit me up [on [GSN app name]] with that. I'm going to laugh. −21 year old