Network correlates of sexual health advice seeking and substance use among members of the Los Angeles House and Ball communities

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Abstract

House and Ball communities (HBCs), represent a prime context for human immunodeficiency virus prevention with African American young men who have sex with men and transgender persons. This study sought to understand the composition and function of social support and sexual networks of HBC members in Los Angeles, California ($N = 263$). Participants were recruited using venue-based sampling and asked to report on sexual health advice seeking, alcohol use and illicit substance use. Participants were more likely to seek sexual health advice from social support network members compared with sexual network members [odds ratio (OR): 2.50, $P < 0.001$]. HBC members were more likely to get drunk (OR: 1.57; $P < 0.05$) and use illicit substances (OR: 1.87; $P < 0.10$) with House members and sexual network members compared with non-House members and social support network members. Health promotion programs tailored for the HBC should encourage open communication regarding sexual health; these interventions must include information about the role of substance use in sexual risk taking.

Introduction

African American men have the highest incidence of human immunodeficiency virus (HIV) when compared with all other racial and ethnic groups and an incidence rate almost eight times higher than their White counterparts [1]. Numerous studies have demonstrated that African American young men who have sex with men (YMSM) experience higher prevalence of HIV than any other racial or ethnic group within the YMSM community [2–6]. However, studies have also demonstrated that African American YMSM (AAYMSM) do not exceed the behavioral risk taking of Latino and White YMSM. For example, compared with Latino and White YMSM, AAYMSM have less unprotected sex and fewer insertive and receptive anal sex partners [7, 8]. These findings have led researchers to develop alternative explanations for increasing HIV infection among AAYMSM despite current prevention efforts [9].

Some have attributed high rates of HIV among African American MSM to the closed nature of these men's sexual networks, which may be the result of discrimination or exclusion [10, 11]. African American MSM are more likely to choose partners of the same race compared with partners of

other races, which may put them at greater risk for HIV transmission due to higher HIV prevalence rates among African American men compared with men in all other racial and ethnic groups [12]. A recent study by VanDevanter *et al.* [13] found that infrequent condom use among AAYMSM was influenced by multiple factors, such as serosorting behavior (seeking out partners of the same HIV status), older partners' refusal to wear a condom and/or history of sex work. Although alcohol and illicit substance use are more prevalent among White and Latino YMSM [14, 15], these factors may also promote engagement in sexual risk behavior among AAYMSM [16].

AAYMSM's social and sexual networks may be important in understanding disproportionate HIV infection in this population [9]. Social networks refer to a set of individuals connected by social bonds (e.g. family membership, friendship) or social processes (e.g. advice seeking, social support). Social network members may influence another member's behaviors based on social comparison, social sanctions and rewards, socialization and information exchange [17–19]. The social network principal of homophily posits that individuals will cluster together in networks based on similar behavioral characteristics [20] and previous studies with other vulnerable youth, including YMSM, have demonstrated that individuals with more risk taking in their social networks are more likely to engage in risk behavior themselves [21, 22]. In addition, studies with other populations at high risk for HIV infection have found that substance use is more likely to occur among members of sexual networks (compared with social support networks), which has significant implications for HIV intervention delivery [23].

Relatively little is known about sexual health communication within networks of AAYMSM. Hart and Peterson [24] found that unsupportive peer norms about condom use were associated with unprotected anal intercourse in a large sample of AAYMSM ages 18–25, which is consistent with studies of older AAYMSM [25] and African American adolescents, in general [26]. Another study, which used a network approach to data collection, determined that perceived social norms

supportive of participants' own use of condoms were associated with lower HIV risk behavior, even when perceived norms did not support condom use by participants' peers [27]. A more recent qualitative study on racially and ethnically diverse YMSM, including AAYMSM, demonstrated high levels of sexual communication between participants, their gay male friends and their heterosexual female friends; however, the content of this communication, while intended to be supportive of safer sex practices, may have actually increased YMSM's risk for HIV [28]. This study seeks to further elucidate sexual health communication patterns among AAYMSM and others in the Los Angeles House and Ball Communities (HBCs).

House and Ball communities

AAYMSM are considered a 'difficult-to-reach' population [29, 30]. HBCs, kinship networks of racial/ethnic minority MSM and transgender individuals who gather for competitions based in modeling and dance, may be one way to reach these populations at high risk for HIV infection [31]. HBCs originated in Black traditions of 1920's Harlem that offered communal social support for Black gay males [32]. The term 'House' refers to the kinship relationship between individuals or networks, whether a physical entity exists or not [33]. Houses are run by a 'House mother' or 'House father' who assumes the role of caring for House members. Houses compete in 'Balls'—competitions modeled after runway or dance performances where Houses compete for recognition within the community. HBCs exist in major urban centers across the United States including Oakland, Atlanta, Chicago, Philadelphia, Baltimore, Washington, DC and Los Angeles [34].

High rates of HIV infection among HBCs have prompted researchers to focus attention on this subpopulation of racial/ethnic minority individuals. However, the majority of these studies has been conducted on the east coast [32, 35–37] and has not incorporated information on members' personal networks. This study sought to: (i) understand the composition of social support and sexual networks of the

Los Angeles HBCs and (ii) document the associations between social support and sexual network characteristics and sexual health advice seeking, alcohol and illicit drug use in this population. The overarching goal of this analysis was to understand whether health protective (i.e. sexual health advice seeking) and risk (i.e. alcohol and illicit drug use) behaviors were more likely to occur within social support networks or sexual networks in order to inform tailored health behavior interventions for the Los Angeles HBC.

Methods

Procedures

Two hundred sixty-three participants were recruited at 12 survey events between February 2009 and January 2010. Individuals were recruited regardless of gender, sexual identity or behavior in order to represent the entire community of individuals attending Balls in Los Angeles. HBC members were eligible to participate if they attended an event during the study time period and had not previously participated in the research survey. Sampling procedures were modeled after the Healthy Young Men's Study, a longitudinal study looking at the many interpersonal, familial and community contextual factors that influence drug use, HIV risk and health promoting behaviors among YMSM [38]. Venue selection and participant recruitment were adapted for the target community. Recruitment venues were categorized into three types: Balls, House meetings and community events. Events and venues included in the sampling frame had at least a 2-h time period with an expected yield of at least four HBC members. Private survey areas were created at Balls and other events through the use of portable 'voting booths' designed for the project. Sampling periods typically occurred during late-night or early-morning hours.

Study staff approached persons who entered the designated event or venue to assess eligibility. A total of 296 people were found eligible to take the survey; 287 (97%) completed the survey, and 24 surveys were deemed duplicates and excluded after reviewing demographic and other survey data. The final sample was 263 people (89% response rate). Eligible persons were escorted to the private survey booths to complete the data collection activity. Participants completed a 30- to 45-min audio computer-assisted self-interview (ACASI) survey on site. All participants provided written informed consent. For persons younger than 18, a waiver of parental permission was obtained. Participants received a $40 incentive for completing this survey. This study received approval from the Committee on Clinical Investigations at Children's Hospital, Los Angeles. More in-depth information regarding study methodology is available elsewhere [39, 40].

Measures

Demographic characteristics

Participants were asked to report on a variety of demographic variables, including age in years, gender (recoded as $1 =$ male, $0 =$ other), race/ethnicity (recoded as $1 =$ African American, $0 =$ other), multiethnicity ($1 =$ multiethnic, $0 =$ single ethnicity) and history of financial hardship, operationalized as number of times in the past 3 months the participant ran out of money for his/her basic needs ($0 =$ 'never', $1 =$ 'less than once a month', $2 =$ 'about once a month', $3 =$ 'one to three times a month', $4 =$ 'once a week', $5 =$ 'many times a week'). A binary item indicated whether the participant was currently a House member ($1 =$ yes, $0 =$ no).

Sexual health

Sexual health questions pertaining to the present analysis included whether participants had ever had a sexually transmitted infection (STI) ($1 =$ yes, $0 =$ no) and whether they had ever participated in an HIV prevention program, which was defined as having ever participated in a workshop or group intervention, received individual HIV counseling or other services ($1 =$ yes, $0 =$ no).

Alcohol misuse

Past 30-day alcohol misuse was based on a series of items assessing frequency and intensity of alcohol

use in the past 30 days. Indicators of frequent alcohol use (three or more times per week) and binge drinking (five or more drinks in a single sitting) were recoded into a single binary item representing 30-day misuse (1 = frequent and/or binge drinking in the past 30 days, 0 = no alcohol use or light use in the past 30 days).

Drug use

Drug use was operationalized as whether participants had used any illicit drugs, including cocaine, heroin, ecstasy, methamphetamine/crystal meth, 'club drugs' including GHB and ketamine, poppers, hallucinogens, crack or other forms of speed, inhalants (e.g. nitrous), prescription drugs without a doctor's prescription, and/or injected drugs in the past 3 months (coded as 1 = yes to any drug, 0 = no to all drugs).

Social versus sexual networks

Egocentric networks were generated by asking participants to name up to five people in their lives who provided emotional support (i.e. network members they felt they could talk to about things that are very personal and private or to obtain advice) or tangible support (i.e. network members they felt they could ask for monetary assistance, up to $50), or with whom they attended Ball events. Respondents then named up to five additional people with whom they had had sex in the past 3 months (and indicated whether any of the previously nominated network members were also sexual partners in the past 3 months) for a total of 10 possible network members. Any network members with whom the participant had had sex in the past 3 months were classified as sexual network members; all others were classified as social support network members. A binary measure of whether a nominee was a social, rather than sexual, network member was used in all analyses (1 = social support network only, 0 = sexual network).

Network member characteristics

A series of questions was then asked about each participant's network members, including: the

network member's age in years, gender (recoded as 1 = male, 0 = other), race/ethnicity (recoded as 1 = African American, 0 = other), whether the network member was currently a House member (1 = yes, 0 = no), how influential the participant believed each network member was in his/her life (using a 10-point Likert-type scale where 1 = 'no influence' and 10 = 'most influential person'), the number of years the participant had known the network member, and how frequently the participant communicated with the network member (recoded as weekly or more often = 1, less than once a week = 0). Outcome measures were also assessed at the network level and included whether the participant felt he/she could ask the network member for sexual or other health advice; whether the participant had gotten drunk with that network member in the past 3 months; and whether the network member had used illicit drugs in the past 3 months (1 = yes, 0 = no for each measure).

Statistical analysis

Univariate and bivariate analyses were conducted in the Statistical Package for the Social Sciences, Version 19.0. Bivariate and multivariate multilevel logistic regressions were conducted using Mplus software, Version 6 [41], with network members nested within their nominating participants, to model the effects of network and participant characteristics on network-level sexual/health advice, alcohol use and drug use outcomes. For all three outcomes, bivariate logistic regression analyses were conducted with an initial set of variables at the participant level (i.e. age, male gender, African American race, multiethnicity, financial hardship and House membership) and the network level (i.e. membership in social versus sexual network, age, male gender, African American race, House membership, influence, years known and weekly communication). The model for sexual/health advice seeking included STI history and HIV prevention participation; the model for getting drunk with the respondent included the respondent's 30-day alcohol misuse; the final model for network members' drug use included respondent's 3-month

drug use. Variables that were statistically significantly associated with outcomes at the bivariate level were included in multivariate models. Final models presented here only included those variables that were statistically significant in the multivariate analyses. Intraclass correlations between the ego and alter levels are presented by outcome in the corresponding tables.

Results

Descriptive statistics for participants are summarized in Table I. The majority of participants described their primary race/ethnicity as Black/African American (83%) and their gender as male (89%). The average age was ~24 years, with 80% of the sample being 25 or younger. Over half identified as gay or another same-sex sexual identity (66%); however, fewer described being attracted to men exclusively (52%). A majority of respondents reported living either in their own place/apartment (49%) or with family (37%). Many participants reported being employed (35%) or both in school and employed (25%); however, ~20% reported being neither in school nor employed. About one-fifth of participants (21%) reported having no medical insurance coverage.

Among the 263 participants surveyed, a total of 1036 social support network and 304 sexual network members were nominated (Table II). On average, sexual network members were younger than social support network members ($M = 25.0$, SD = 6.0 versus $M = 31.4$, SD = 13.5, $P < 0.001$). A greater percentage of sexual network members were male compared with social support network members ($P < 0.001$). Social support network members were known longer ($P < 0.001$), had a higher degree of influence over participants ($P < 0.001$), and communicated with participants more frequently ($P < 0.01$) than sexual network members. A greater percentage of social support networks than sexual network members were in a House ($P < 0.001$), attended Balls with the participant ($P < 0.01$) and provided sexual health advice to participants ($P < 0.001$). In contrast, a greater percentage of sexual network members got drunk with the respondent ($P < 0.001$) or used drugs ($P < 0.10$) compared with social support network members.

Sexual/health advice seeking

Significant network membership correlates for whether the participant felt comfortable asking a given network member for sexual or health advice (Table III) included whether that member was in their social, rather than sexual, network [odds ratio (OR) = 2.499, $P < 0.001$], the degree of influence of that network member (OR = 1.336, $P < 0.001$), how long the participant had known the network member (OR = 0.968, $P < 0.01$), and whether the participant and network member communicated weekly (OR = 2.061, $P < 0.01$). Additionally, participants who had taken part in an HIV prevention program were significantly more likely to seek sexual or health advice from their networks (OR = 1.943, $P < 0.05$); a non-significant trend suggested that older participants were more likely to seek advice overall (OR = 1.044, $P < 0.10$). A follow-up analysis including only social support network members probed whether the participant's relationship to the network member (e.g. friend or casual acquaintance versus family member) affected the likelihood of seeking sexual or health advice from that member, but the relationship type did not significantly impact willingness to seek advice.

Alcohol misuse

Network characteristics were also correlated with the likelihood the participant reported having gotten drunk with a given network member in the past 3 months (Table IV). Participants were most likely to have gotten drunk with younger network members (OR = 0.945, $P < 0.001$), males (OR = 1.680, $P < 0.05$), the more recently befriended (OR = 0.939, $P < 0.001$), those with whom the participant communicated at least weekly (OR = 2.912, $P < 0.001$) and House members (OR = 1.568, $P < 0.05$). Participants who were themselves House members, however, were overall less likely to get drunk with any of their network

Table I. *Descriptive characteristics of total sample (n = 263)*

Variable	N (%) or mean (SD)
Age (range: 17–53)	23.74 (6.16)
Age category (years)	
17–20	78 (30)
21–25	131 (50)
26+	34 (21)
Gender	
Male	233 (89)
Female	17 (7)
Transgender MtF/femme queen	10 (4)
Transgender FtM	1 (0)
Other	2 (1)
Primary ethnicity	
Native American	7 (3)
Asian/Asian American/ Pacific Islander	3 (1)
Black/African American	218 (83)
Latino/Hispanic	17 (7)
White/Caucasian	2 (1)
Other	16 (6)
Multiethnic	85 (32)
Residential status	
Family	98 (37)
Own place/apartment	128 (49)
Friends/partner/House/Ball members	32 (12)
No regular place/other	5 (2)
School/work combined	
In school	51 (19)
In school, employed	65 (25)
Employed	91 (35)
Not in school, not employed	56 (21)
No medical insurance	54 (21)
Sexual identity	
Gay/other same sex	173 (66)
Straight	25 (10)
Bisexual	64 (24)
Don't know	1 (0)
Attraction	
Men only	137 (52)
Men and women	111 (42)
Women only	9 (3)
Neither/don't know	5 (2)
House member	136 (52)
Average social network size	5.10 (1.67)
Average no. of emotional support members in network	3.80 (1.92)
Average no. of tangible support members in network	4.04 (1.79)
Average no. of recent sex partners in network	1.16 (1.06)
Average no. of house members in network	1.83 (1.32)

members (OR = 0.549, $P < 0.05$). Participants who had reported misusing alcohol themselves within the past 30 days were significantly more likely to have gotten drunk with any given network member (OR = 5.641, $P < 0.001$).

Drug use

Network members the participant had known for less time were significantly more likely than members with longer-lasting relationships to have used illicit drugs within the past 3 months (OR = 0.890, $P < 0.001$). A non-significant trend suggested that network members who were also House members may be more likely to engage in illicit drug use than non-House-members (OR = 1.868, $P < 0.10$). However, the strongest correlate of whether a network member used illicit substances was whether the nominating participant had also used drugs within the past 3 months (OR = 12.085, $P < 0.001$).

Discussion

This study is the first of its kind to examine the egocentric network characteristics of HBC members. Findings demonstrate diversity in the composition of these individuals' networks. Although the largest category of network members was friends, family members also made up a substantial portion of participants' networks. Romantic and sexual partners made up relatively small segments of HBC members' overall networks. Other House members made up less than a quarter of HBC members' networks and HBC members attended Balls with approximately one-third of their network members. These results are somewhat surprising given previous writings about HBCs, which describe high levels of alienation from families of origin as a primary motivation for joining HBCs [34, 35]. Our findings indicate substantial connection to family of origin and evidence that HBC members derive significant social support from these relationships. Continued connection to family has been shown beneficial in protecting high-risk youth against negative health outcomes [42] and has been called on as a useful approach for reducing HIV among

Table II. *Comparisons between social and sexual network alters nominated by HBC members in Los Angeles (n = 1340)*

Alter characteristic	Network type			Total (*n* = 1340)
	Social (*n* = 1036)	Sexual (*n* = 304)	*P*-value	
Demographics				
Mean age (range: 15–90)	31.40 (13.48)	25.04 (5.99)	0.000	29.96 (12.48)
Gender[a]				
Male	549 (53.0)	275 (90.8)	0.000	824 (61.6)
Female	450 (43.5)	26 (8.6)		476 (35.6)
Transgender	36 (3.5)	2 (0.6)		38 (2.9)
Race/ethnicity[b]				
Native American	4 (0.4)	1 (0.3)	0.902	5 (0.4)
Asian	4 (0.4)	0 (0.0)		4 (0.3)
African American	781 (75.4)	228 (75.0)		1009 (75.3)
Latino/Hispanic	64 (6.2)	24 (7.9)		88 (6.6)
White	21 (2.0)	4 (1.3)		25 (1.9)
Other	16 (1.5)	5 (1.3)		20 (1.5)
Mixed	146 (14.1)	43 (14.1)		189 (14.1)
Time known (years)	11.08 (9.12)	2.70 (3.02)	0.000	9.37 (8.92)
Mean influence (range 1–10)	7.53 (2.64)	6.17 (3.28)	0.000	7.22 (2.85)
Communication[c]				
Less than once a month	16 (1.6)	21 (6.9)	0.001	37 (1.7)
About once a month	37 (3.6)	11 (3.6)		48 (3.6)
A few times a month	89 (8.6)	42 (13.9)		131 (9.8)
A few times a week	258 (24.9)	64 (21.2)		322 (24.1)
Every day	636 (61.4)	164 (54.3)		800 (59.8)
Relationship type				
Parent	152 (14.7)	–		152 (11.4)
Other family member	255 (24.6)	–		255 (19.0)
Romantic partner	–	123 (40.6)		123 (9.2)
Casual sex partner	–	76 (52.1)		76 (5.7)
Friend	558 (53.9)	77 (25.4)	0.000	635 (47.4)
Other[d]	71 (6.9)	27 (8.9)	0.755	85 (7.3)
House/Ball relationship				
Member of my house	120 (11.7)	12 (4.0)	0.000	132 (9.9)
Member of other house	122 (11.8)	49 (16.3)		171 (12.8)
Not a house member	788 (76.5)	240 (79.7)		1028 (77.2)
Attends Balls with respondent	394 (38.0)	86 (28.4)	0.002	480 (35.8)
Support provided				
Emotional support	791 (76.4)	208 (68.6)	0.007	999 (74.6)
Instrumental support	850 (82.0)	212 (70.0)	0.000	1062 (79.3)
Sexual health advice	650 (62.7)	143 (47.2)	0.000	793 (59.2)
Sex partner				
Lifetime sex partner (not current)	41 (4.0)	304 (100.0)	0.000	345 (25.7)
Substance use				
Drunk with respondent	341 (32.9)	140 (46.2)	0.000	481 (35.9)
Illicit drug use	101 (9.7)	40 (13.2)	0.069	141 (10.5)

[a]Testing done between males and all others. [b]Testing done between African American and all others. [c]Testing done between >1×/week versus <1×/week. [d]Other category includes colleagues, casual acquaintances, ex-sex partners and others. Comparisons between social support network versus sexual network conducted using multilevel bivariate logistic regression.

Table III. *Multivariate logistic regression analyses for seeking sexual health advice from alter*

Variable	Estimate	OR	95% CI
Alter-level variable			
Social network member	0.916	2.499	(1.451, 4.306)
Influence	0.290	1.336	(1.205, 1.483)
Years known	−0.033	0.968	(0.940, 0.995)
Weekly communication	0.723	2.061	(1.085, 3.912)
Ego-level variable			
Age	0.043	1.044	(0.997, 1.091)
HIV prevention participation	0.658	1.931	(1.317, 2.544)

Intraclass Correlation = 0.436.

Table IV. *Multivariate logistic regression analyses for getting drunk with alter*

Variable	Estimate	OR	95% CI
Alter-level variable			
House member	0.450	1.568	(0.905, 2.718)
Age	−0.057	0.945	(0.919, 0.971)
Male gender	0.519	1.680	(0.978, 1.889)
Years known	−0.063	0.939	(0.905, 0.973)
Weekly communication	1.069	2.912	(1.521, 5.582)
Ego-level variable			
Alcohol misuse	1.730	5.641	(4.959, 6.323)
House membership	−0.599	0.549	(0.014, 1.084)

ICC = 0.426.

YMSM [43]. Consideration of family-based interventions for HBC members warrants further attention.

Our findings suggest substantial differences between social and sexual networks of HBC members in demographic characteristics, HBC affiliation and risk behavior. Social support network members had known respondents longer, provided higher levels of social and tangible support, had greater influence on respondents, and communicated with respondents more frequently than sexual network members. Sexual network members were more likely to get drunk with participants and to use illicit substances. In addition, greater percentages of social support network members were affiliated with the HBC compared with sexual network members. Previous

Table V. *Multivariate logistic regression analyses for drug use of alter*

Variable	Estimate	OR	95% CI
Alter-level variable			
House member	0.625	1.868	(0.739, 4.719)
Years known	−0.117	0.890	(0.838, 0.943)
Ego-level variable			
Illicit drug use (ever)	2.492	12.085	(10.760, 13.410)

ICC = 0.681.

studies of HBCs elsewhere have demonstrated that these communities provide opportunities for both risk taking and social support [34–37]. In our analyses, we note that the sexual networks of HBC members largely extended beyond the HBC. Further information regarding where HBC members meet potential sexual partners and the nature of those sexual encounters are necessary to better promote sexual health with this population.

Results from this study may have significant implications for HIV transmission both within the HBC, the broader African American community, and beyond. Specifically, it can be inferred that the sexual networks of HBC members are not insular, given that only approximately one-quarter of participants' sexual network members comprised other HBC-involved individuals. In addition, over 80% of respondents and 75% of sexual partners were African American, suggesting that the HBC is an appropriate avenue for reaching at-risk AAYMSM. Because AAYMSM and transgender persons have been described as difficult-to-reach [29–30], prevention professionals would be wise to consider network-based intervention strategies, which are designed for diffusion through sexual networks [44]. This would enable them to reach out to and to promote safer sexual behaviors among HBC members and their partners, presenting a promising way to reduce HIV incidence within the HBC and the larger African American community.

Sexual health advice seeking

Overall, social support network members were more likely to be sought out for sexual health advice compared with sexual network members. Combined

with information on the duration of social support network relationships and the frequency of communication between participants and their social support network members, these results indicate the potential for sexual health interventions implemented through social support networks. A study by Mutchler and McDavitt [28] examined sexual health communication among young gay men and found that although peer communication regarding sexual behavior was intended to promote safer sex behavior, inaccurate assumptions about HIV risk assessment may have actually put young gay men at higher risk for HIV. Our results with the HBC indicate participants' willingness to engage in conversations about sexual health with social support network members and those known for less time. Although it might be counter-intuitive that participants would be more likely to seek sexual health advice from network members who they have known for shorter durations, it is important to take into account that social network alters included family members (e.g. parents, siblings, grandparents), individuals from whom many HBC members may not want to seek sexual health advice. Little is known about the content of the sexual health advice exchanged between participants and HBC members; more in-depth information about sexual communication between HBC members and members of their social support networks is warranted. Furthermore, it is unclear whether willingness to seek out sexual health advice may actually result in following the advice received, which should also be addressed in future research.

In addition, those in our study who had participated in an HIV prevention program previously were more likely to seek sexual health advice from network members. With cross-sectional data it is impossible to determine the direction of this association. Although it is possible that those who participate in HIV prevention are naturally more open to discussing sexual behavior, it is also possible that previous engagement with HIV prevention services has prompted greater willingness to engage in sexual health advice seeking. Previous qualitative work with the HBC in Los Angeles has demonstrated their engagement with HIV prevention

efforts [31]. More information is needed on community norms regarding sexual health advice seeking within and beyond the HBC community.

Alcohol misuse and illicit substance use

Alcohol use with the nominating participant and illicit substance use among network members were both associated with individual behavior and House membership. Participants who reported frequent or binge drinking were more likely to get drunk with network members than non-frequent or light users, and those who were illicit substance users themselves were more likely to have other illicit substance users in their networks. These findings are consistent with a large body of social network literature, which indicates that higher risk taking among network members is associated with higher risk taking among the participant himself [21, 22]. Homophily, the grouping of like individuals in networks, has been attributed to both selection and social influence. Individuals who use substances may seek out other substance users (selection) or may be encouraged to use substances through norming of use in social networks (social influence). Although it is impossible to determine from cross-sectional data whether our findings are attributable to influence or selection, our results of high levels of getting drunk within networks and illicit substance use among network members warrant additional attention. Further research should be conducted into the motivations for substance use among HBC members and community norms related to substance use within HBCs.

Prevention interventions targeted at reducing sexual risk behavior in the HBC should include information on substance use. As our results have shown, sexual network members were more likely to get drunk with participants and use illicit substances than social support network members. In addition, participants were more likely to get drunk with others who were members of a House and House members were more likely to use illicit substances compared with non-House members. Given that substance use has been associated with greater sexual risk behaviors among YMSM in

general [45–47] and AAYMSM specifically [16], additional work should be conducted to further understand the role of substance use in sexual relationships among HBC members. HBC community leaders may be amenable to structural changes in Balls and other community events that deter substance use in these venues.

Limitations

This study has limitations, which should be taken into account when interpreting the results. This study focused exclusively on the Los Angeles HBC, which limits its generalizability to HBC throughout the United States, especially because demographic characteristics of our sample differed from previously studied HBCs in other cities [32, 35]. All data were based on self-report, which may be subject to social desirability bias. Although use of ACASI data collection techniques should reduce social desirability bias [48], it is difficult to know whether this occurred in this study. In order to reduce respondent burden we limited the network inventory to 10 nominations, which may have artificially truncated the networks of some participants. Bias may be present in reports of network members' substance use as this report is based on participant perception and did not necessarily occur with the participant. Finally, we did not collect data on the type of sex HBC members engaged in with sexual network members or information on condom use within sexual network partnerships. Without this information, it was impossible to determine the extent to which HBC members engaged in risky sexual behavior.

Conclusion

Despite these limitations, this study has significant implications for HIV prevention within the HBC and more broadly. First, given that a large percentage of social support networks comprised family members, it seems prudent to explore the feasibility of family-based HIV prevention with this population. Family-based intervention programs for diverse populations of young people have been effective in reducing substance use and sexual risk behavior previously [49–51]. With over 30% of HBC member networks comprised family, intervention programs aimed at increasing sexual health communication between HBC members and their families may be an effective strategy for reducing risk behaviors in this population. Others have called for family-based HIV prevention for YMSM [43] given the important role of parents in the lives of gay youth [52]. However, further research on the acceptability of family-based interventions must be tempered by the recognition that HBC community members may have been rejected by families of origin, as suggested by prior work [32, 35].

Consistent with existing research with HBC communities elsewhere, our findings clearly point to the urgent need to develop effective interventions for this population. This study revealed a high self-reported HIV prevalence among AAMSM the Los Angeles HBC (6%) [33]. Given that HBC community members' sexual networks extend beyond the HBC itself, interventions designed for HBC members have the potential to diffuse to the larger African American community and beyond. One social network-based intervention that has been used with varying success, depending on the fidelity of its implementation, is the popular opinion leader (POL) model [53]. This approach, which uses key opinion leaders to engage their social network members in conversations regarding HIV and change risk behaviors through social influence, may be particularly useful for the HBC. Naturally occurring POLs may include House mothers and fathers or other influential community members. Modifications to the POL model to be implemented within sexual networks among HBC members/participants may have a wider reach into the AAYMSM community, where HIV prevention is urgently needed.

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Conflict of interest statement

None declared.

References

1. Prejean J, Song R, Hernandez A *et al.* Estimated HIV incidence in the United States, 2006–2009. *PLoS One* 2011; **8**: e17502.

2. Agwu A, Ellen J. Rising rates of HIV infection among young US men who have sex with men. *Pediatr Infect Dis J* 2009; **28**: 633–4.

3. Celentano D, Sifakis F, Hylton J *et al.* Race/ethnic differences in HIV prevalence and risk among adolescent and young men who have sex with men. *J Urban Health* 2005; **82**: 610–21.

4. Clerkin EM, Newcomb ME, Mustanski B. Unpacking the racial disparity in HIV rates: the effect of race on risky sexual behavior among Black young men who have sex with men (YMSM). *J Behav Med* 2011; **34**: 237–43.

5. Garofalo R, Mustanski B, Johnson A *et al.* Exploring factors that underlie racial/ethnic disparities in HIV risk among men who have sex with men. *J Urban Health* 2010; **87**: 318–23.

6. Halkitis PN, Brockwell S, Siconolfi DE *et al.* Sexual behaviors of adolescent emerging and young adult men who have sex with men ages 13-29 in New York city. *J Acquir Immune Defic Syndr* 2011; **56**: 285–91.

7. Harawa NT, Greenland S, Bingham TA *et al.* Associations of race/ethnicity with HIV prevalence and HIV-related behaviors among young men who have sex with men in 7 urban centers in the United States. *J Acquir Immune Defic Syndr* 2004; **35**: 526–36.

8. Sifakis F, Hylton, JB, Flynn C *et al.* Racial disparities in HIV incidence in young men who have sex with men. The Baltimore young men's survey. *J Acquir Immune Defic Syndr* 2007; **46**: 343–48.

9. Feldman MB. A critical literature review to identify possible causes of higher rates of HIV infection among young black and Latino men who have sex with men. *J Natl Med Assoc* 2010; **102**: 1206–21.

10. Adimora AA, Schoenbach VJ, Doherty IA. HIV and African Americans in the southern United States: sexual networks and context. *Sex Transm Dis* 2006; **3**: 39–45.

11. Raymond HF, McFarland W. Racial mixing and HIV risk among men who have sex with men. *AIDS Behav* 2009; **13**: 630–37.

12. Berry M, Raymond HF, McFarland W. Same race and older partner selection may explain higher HIV prevalence among black men who have sex with men. *AIDS* 2007; **21**: 2349–50.

13. VanDevanter N, Duncan A, Burrell-Piggott T. The influence of substance use, social sexual environment, psychosocial factors, and partner characteristics on high risk sexual behavior among young Black and Latino men who have sex with men living with HIV: a qualitative study. *AIDS Patient Care STDS* 2011; **24**: 113–21.

14. Kipke MD, Weiss G, Ramirez M *et al.* Club drug use in Los Angeles among young men who have sex with men. *Subst Use Misuse* 2007; **42**: 1723–43.

15. Wong CF, Kipke MD, Weiss G. Risk factors for alcohol use, frequent use, and binge drinking among young men who have sex with men. *Addict Behav* 2008; **3**: 1012–20.

16. Warren JC, Fernandez MI, Harper GW *et al.* Predictors of unprotected sex among young sexually active African American, Hispanic and White MSM: the importance of ethnicity and culture. *AIDS Behav* 2008; **12**: 459–68.

17. Wenzel SL, Green HD Jr, Tucker JS *et al*. The social context of homeless women's alcohol and drug use. *Drug Alcohol Depend* 2009; **105**: 16–23.

18. Rice E, Stein JA, Milburn N. Countervailing social network influences on problem behaviors among homeless youth. *J Adolesc* 2008; **31**: 625–39.

19. Fisher JD. Possible effects of reference group-based social influence on AIDS-risk behavior and AIDS prevention. *Am Psychol* 1988; **43**: 914–20.

20. McPherson M, Smith-Lovin L, Cook JM. Birds of a feather: homophily in social networks. *Annu Rev Sociol* 2001; **27**: 415–44.

21. Rice E, Milburn NG, Rotheram-Borus MJ *et al*. The effects of peer group network properties on drug use among homeless youth. *Am Behav Sci* 2005; **48**: 1102–23.

22. Tucker JS, Hu J, Golinelli D *et al*. Social network and individual correlates of sexual risk behavior among homeless young men who have sex with men. *J Adolesc Health* 2012; **51**: 386–92.

23. Wenzel SL, Holloway IW, Golinelli D *et al*. Social networks of homeless youth in emerging adulthood. *J Youth Adolesc* 2001; **41**: 561–71.

24. Hart TA, Peterson JL. Predictors of risky sexual behavior among young African American men who have sex with men. *Am J Public Health* 2004; **94**: 1122–3.

25. Jones KT, Johnson WD, Wheeler DP *et al*. Nonsupportive peer norms and incarceration as HIV risk correlates for young Black men who have sex with men. *AIDS Behav* 2008; **12**: 41–50.

26. Romer D, Black M, Ricardo I *et al*. Social influences on the sexual behavior of youth at risk for HIV exposure. *Am J Public Health* 1994; **84**: 977–85.

27. Peterson JL, Rothenberg R, Kraft JM *et al*. Perceived condom norms and HIV risks among social and sexual networks of young Black men who have sex with men. *Health Educ Res* 2009; **24**: 119–27.

28. Mutchler MG, McDavitt B. 'Gay boy talk' meets 'girl talk': HIV risk assessment assumptions in young gay men's sexual health communication with best friends. *Health Educ Res* 2010; **26**: 489–505.

29. Phillips G II, Peterson J, Binson D *et al*. House/ball culture and adolescent African-American transgender persons and men who have sex with men: a synthesis of the literature. *AIDS Care* 2011; **23**: 515–20.

30. Hightow-Weidman LB, Phillips G, Jones KC *et al*. Racial and sexual identity-related maltreatment among minority YMSM: prevalence, perceptions, and the association with emotional distress. *AIDS Patient Care STDS* 2011; **25**: 39–45.

31. Holloway IW, Traube D, Kubicek K *et al*. HIV prevention service utilization in the Los Angeles House and Ball communities: past experiences and recommendations for the future. *AIDS Educ Prev* 2012; **25**: 431–44.

32. Murrill CS, Liu KL, Guilin V *et al*. HIV prevalence and associated risk behaviors in New York City's house ball community. *Am J Public Health* 2008; **98**: 1074–80.

33. Kipke MD, Kubicek K, Supan J *et al*. Laying the groundwork for an HIV prevention intervention: a descriptive profile of the Los Angeles House and Ball communities. *AIDS Behav* 2013; **17**: 1068–81.

34. Arnold EA, Bailey MM. Constructing home and family: how the ballroom community supports African American GLBTQ youth in the face of HIV/AIDS. *J Gay Lesbian Soc Serv* 2009; **2**: 171–88.

35. Sanchez T, Finlayson T, Murrill C *et al*. Risk behaviors and psychosocial stressors in the New York city house ball community: a comparison of men and transgender women who have sex with men. *AIDS Behav* 2010; **14**: 351–8.

36. Galindo GR. A loss of moral experience: understanding HIV-related stigma in the New York City House and Ball community. *Am J Public Health* 2013; **103**: 293–9.

37. Castillo M, Palmer BJ, Rudy BJ *et al*. Creating partnerships for HIV prevention among YMSM: the connect to protect project and House and Ball community in Philadelphia. *J Prev Interv Community* 2012; **40**: 165–75.

38. Ford WL, Weiss G, Kipke MD *et al*. The healthy young men's study: sampling methods to recruit a random cohort of young men who have sex with men. *J Gay Lesbian Soc Serv* 2009; **21**: 357–73.

39. Kipke MD, Kubicek K, Supan J *et al*. Laying the groundwork for an HIV prevention intervention: a descriptive profile of the Los Angeles House and Ball communities. *AIDS Behav* 2013; **17**: 1068–81.

40. Kubicek K, McNeeley M, Holloway IW *et al*. "It's like our own little world": resilience as a factor in participating in the ballroom community subculture. *AIDS Behav* 2013; **17**: 1524–39.

41. Muthén L, Muthén B. *Mplus User's Guide (1998–2007)*. Los Angeles: Muthén & Muthén, 2007.

42. Rice E, Milburn NG, Rotheram-Borus MJ. Pro-social and problematic social network influences on HIV/AIDS risk behaviours among newly homeless youth in Los Angeles. *AIDS Care* 2007; **19**: 697–704.

43. Garofalo R, Mustanski BS, Donenberg GR. Parents know and parents matter: is it time to develop family-based HIV prevention programs for young men who have sex with men? *J Adolesc Health* 2008; **43**: 201–4.

44. Valente TW, Fosados R. Diffusion of innovations and network segmentation: the part played by people in promoting health. *Sex Transm Dis* 2006; **7**: S23–31.

45. Clatts MC, Goldsamt LA, Yi H. Club drug use among young men who have sex with men in NYC: a preliminary epidemiological profile. *Subst Use Misuse* 2005; **40**: 1317–30.

46. Dudley MG, Rostosky SS, Korfhage BA *et al*. Correlates of high-risk sexual behavior among young men who have sex with men. *AIDS Educ Prev* 2004; **16**: 328–40.

47. Mansergh G, Colfax GN, Marks G *et al*. The Circuit Party Men's Health Survey: findings and implications for gay and bisexual men. *Am J Public Health* 2001; **91**: 953–8.

48. Newman JC, Des Jarlais DC, Turner CF *et al*. The differential effects of face-to-face and computer interview modes. *Am J Public Health* 2002; **92**: 294–7.

49. Donenberg GR, Paikoff R, Pequegnat W. Introduction to the special section on families, youth, and HIV. Family-based intervention studies. *J Pediatr Psychol* 2006; **31**: 869–73.

50. Guilamo-Ramos V, Jaccard J, Dittus P *et al*. The linking lives health education program: a randomized clinical trial of a

parent-based tobacco use prevention program for African American and Latino youths. *Am J Public Health* 2009; **100**: 1641–7.

51. Mallow RM, Kershaw T, Sipsma H *et al*. HIV preventive interventions for adolescents: a look back and ahead. *Curr HIV/AIDS Rep* 2007; **4**: 173–80.

52. LaSala M. Parental influence, gay youths, and safer sex. *Health Soc Work* 2007; **31**: 49–55.

53. Kelly JA. Popular opinion leaders and HIV prevention peer education: resolving discrepant findings, and implications for the development of effective community programmes. *AIDS Care* 2004; **16**: 139–50.