

Condomless Sex Among Homeless Youth: The Role of Multidimensional Social Norms and Gender

Anamika Barman-Adhikari¹ · Hsun-Ta Hsu² · Stephanie Begun¹ · Andrea Perez Portillo¹ · Eric Rice³

Published online: 24 November 2016
© Springer Science+Business Media New York 2016

Abstract Most studies of condomless sex among homeless youth have focused on peer norms, while excluding other potentially pertinent influences. This study explored how different types of relationships contributed to norms about condomless sex and whether such norms were associated with engagement in condomless sex among homeless youth. Additionally, because recent work has noted gender differences in social networks of male and female homeless youth, gender differences in social network norms of condomless sex were also assessed. Egocentric network data were collected from homeless youth accessing services at two drop-in centers in Los Angeles, CA (N = 976). Multivariate analyses (non-stratified and stratified by gender) assessed associations between descriptive, injunctive, and communicative norms and participants' engagement in condomless sex. Multivariate analyses indicated that perception of peer condom use and communication with sexual partners were significantly associated with not engaging in condomless sex. These relationships, however, varied by gender. Implications for interventions are discussed.

Keywords Condomless sex · Homeless youth · Perceived social norms · Referent groups, gender differences

✉ Anamika Barman-Adhikari
anamika.barmanadhikari@du.edu

¹ Graduate School of Social Work, University of Denver, 2148 S. High St., Denver, CO 80208, USA

² School of Social Work, University of Missouri, Columbia, MO, USA

³ School of Social Work, University of Southern California, Los Angeles, CA, USA

Introduction

HIV/AIDS is a particularly critical public health threat among homeless youth, who are estimated to be 6–12 times more likely than housed youth to become HIV-infected [1]. Although injection drug use and needle sharing are common among homeless youth [2], unsafe sex appears to exert a greater risk for HIV infection [3–5]. According to the Centers for Disease Control and Prevention (CDC), decades of studies have shown that condoms, if used correctly, are effective in preventing the spread of HIV [6]. However, because of recent scientific and biomedical developments (such as pre-exposure prophylaxis), that are also very effective in preventing HIV we use the term “condomless sex” instead of “unprotected sex” to recognize that there are alternative ways for individuals to protect themselves from sexually transmitted diseases (including HIV) besides using a condom consistently. Homeless youth, however, report very low rates of condom use; 40–70% of youth across various studies reported engaging in condomless sexual intercourse [4, 7, 8].

Factors Associated with Condomless Sex Among Homeless Youth

Numerous demographic and behavioral factors regarding homeless youths' condom use have been identified through prior research. Youths' homelessness status, in general, has demonstrated negative associations with consistent condom use [9]. Many homeless youth use substances before sex [7, 8], which is negatively correlated with condom use [7, 9, 10].

Additionally, studies indicate that engagement in condomless sex differs by gender, race/ethnicity, and sexual orientation. Studies consistently show that female homeless

youth are overall more likely than males to report engaging in condomless sex [3, 11]. Findings on racial differences, however, have been inconsistent. For example, Halcón and Lifson [3] found White homeless youth to be less likely than all other racial/ethnic categories to use condoms, while Black homeless youth were more likely than all other categories to use condoms. Conversely, other studies have found no racial differences in rates of condom use among homeless youth [7, 10, 12]. With regards to sexual orientation, evidence suggests that non-heterosexual homeless youth are generally more likely to engage in condom use during sex, actions that have been attributed to concerted HIV prevention education programs targeting this population [13].

More structural factors, such as having access to condoms, are also known to play a role in homeless youths' engagement in condomless sex, but are factors that have been surprisingly under-studied in recent years. A majority of homeless youth report receiving condoms from service agencies, and those who received condoms reported rates of condom use at last sexual encounter that were far greater compared to youth who did not receive condoms [14, 15].

The Importance of Social Networks and Perceived Social Norms

A nascent development in homeless youth research extends beyond the examination of individual-level HIV risk behavior characteristics, toward examining broader “social environment” influences on such behaviors, such as youths' social networks [16–18]. Social networks are defined as individuals or groups of individuals who share connections and interactions with each other in some way(s). Social networks affect behavior through several means, including that of social norms [19, 20].

Social norms are defined as perceptions regarding what behaviors are prevalent or are considered common or acceptable in a given group [21]. Perceived norms have most often been categorized as *descriptive* or *injunctive*; descriptive norms depict the perceived prevalence of a behavior within a group, whereas injunctive norms denote perceived approval or disapproval of a behavior [19]. In addition to descriptive and injunctive norms, communication among social network contacts is also considered a function of the normative characteristics of networks, and these “communication norms” inform both perception of descriptive and injunctive norms and engagement in risk or protective behaviors [22]. Extant research suggests that social network norms demonstrate compelling associations with individuals' engagement in risk behaviors. However, very few studies have explored social norms of condomless sex among homeless youth. One exception is a study by Tyler [23], who found that a minority of

homeless youth reported social network norms endorsing safer sex practices, but among youth who reported the presence of such endorsements, more consistent condom use was indicated.

Moreover, descriptive and injunctive norms have been shown to influence behavior in diverse ways, and one type of norm may be more compelling than the other, depending upon the behavior [19]. Okun et al. [24] found that people who exercised indicated that they did so because they believed that other people engaged in it (descriptive norms), and not because of how they perceived others would react if they did not exercise (injunctive norms). On the other hand, Rimal and Real [25] found that college students' drinking behaviors were influenced more by the injunctive norms prevalent within their referent groups. These findings suggest a need for further inquiry of the unique effects of descriptive versus injunctive norm in understanding behavior.

Additionally, investigations of social norms have very seldom focused on whether or not it is socially acceptable to communicate about sexual risk behaviors [26]. To the best of our knowledge, no study has yet investigated communication patterns regarding sexual behaviors among homeless youth. Communication about protective behaviors may be critical in understanding the patterns of social normative influence within a social network [26]. Lack of communication might indicate that discussing prosocial behaviors is perceived as disruptive to the existence of the group, and thus may promote a culture of silence [26]. Interventions designed to alter condom use norms might be difficult to implement if discussions about sexual behaviors are not acceptable within networks [26] and therefore are important to investigate.

Multidimensionality of Norms: The Role of the Referent Group

In designing sexual health interventions that are more relevant to this population, it is important to consider the multiple levels of social network influences that homeless youth might encounter when forming attitudes regarding and engaging in behaviors pertaining to condomless sex. Recent research revealed that homeless youths' social network compositions are more diverse than was previously understood, and extend beyond street peers (i.e. family, home-based peers, staff) [27–29]. The presence of these multiple referent groups may have implications for both perceptions of social norms (particularly regarding injunctive norms), and subsequently, engagement in condomless sex, as these different network members may convey unique or even contradictory norms and messages to homeless youth, particularly depending upon specifically who comprises such groups [30, 31].

Festinger's *social comparison theory* [32] is one theory that informs how injunctive norms received from different referent groups can influence behavior. Festinger proposed that individuals form their attitudes by comparing their personal attitudes and behaviors against those of others' [20]. Festinger's theory has been highlighted for its importance in understanding the heterogeneity of norms, as the theory proposes that norms are not based on any objective standards, but rather, are decided based on the cues that are received from social network members [20]. For example, among homeless youth, family norms might encourage or communicate the importance of condom use; peer norms, on the other hand, might discourage use. The relationship between norms and behavior has been shown to differ depending on the nature and influence of the referent [33–35]. In designing and tailoring interventions, it is important to understand which of these influences are most salient in these youths' lives.

Only one known study focusing on condom use among homeless youth has attempted to document these multiple condom use norms [12]. This study found that a strong commitment to a serious partner is associated with engagement in condomless sex, and perhaps paradoxically, that participants who discussed HIV prevention/status with their partner before sex were less likely to use condoms. However, injunctive norms, or the degree to which network members may object to or encourage condom use, were not included in the analyses, suggesting an area for further network analysis research.

Gender Differences in Sexual Risk Behaviors and Social Network Characteristics Among Homeless Youth

Empirical research has noted the importance of gender in understanding homeless youths' sexual behaviors, especially regarding engagement in condomless sex. Homeless young women demonstrate significantly lower rates of condom use [36–38], as well as higher STI rates [5, 38, 39] compared to homeless young men.

Differences in the social networks of homeless young females compared to homeless young males may play a role in such disparities in sexual risk behaviors. Extant research has also suggested that homeless young females' social networks differ from homeless young males' [40]. Homeless young females are more likely to be at the core of social networks when compared to their homeless young male counterparts [40], and are more likely to have network members who engage in risky behaviors [41, 42]. Such evidence may contribute to heightened adverse sexual health risks and outcomes when considering homeless young females in comparison to homeless young males. However, positive associations have been noted among

homeless young females. For instance, homeless young females, who are socially connected to a natural non-street based mentor, are less likely to engage in condomless sex [5]. Taken together, it appears there are salient gender-based differences in condomless sex and adverse sexual health outcomes that most negatively affect young homeless women; social network influences may provide some key explanations for at least a considerable portion of such phenomena.

There is no known study that has specifically looked at gender differences in perceived social norms of condomless sex (descriptive, injunctive, or communicative) among homeless youth; however, findings from studies with other populations have provided indications that perceived social norms of sexual risk behaviors may vary by gender. For example, Mizuno et al. [43] found that perceived descriptive norms, relative to perceived injunctive norms, had a greater effect on females compared to male adolescents. Additionally, this study also found gender differences in referent-group specific norms among their sample of youth. More specifically, encouragement to use condoms wielded by salient referents (i.e., parents, peers, and sex partners) had a larger effect on the attitudes of male adolescents than that of female adolescents. Similarly, Corby et al. [44] found that pressure to use condoms from sex partners was associated with intentions to engage in condom use among males, but not among females. Notable gender differences have been also observed in communication norms of safer sex, studies have typically found that women are generally more likely to communicate about safer sex than men [45]. Additionally, there are gender-based differences regarding with whom youth talk regarding safer sex. For example, Widman et al. [46] found that girls were more significantly likely to discuss safe sex topics with friends and parents than were boys. However, there were no significant gender differences noted in communication with partners about engaging in safe sex.

In light of such findings, researchers have, in recent years, noted the importance of designing interventions specifically tailored to young women who experience homelessness [47]. Notably, interventions designed for populations other than homeless youth have effectively employed social networks to disseminate and emphasize behavioral norms that are encouraging of protective behaviors such as safe sex [22]. However, with a few exceptions as aforementioned, few studies have explored gender differences in social networks among homeless youth, leaving us with little information on how to design effective gender-responsive network-based interventions. Given the dearth of such evidence, we sought to investigate gender-based differences in perceived social network norms of condomless sex among homeless youth.

The Current Study

The present study examines the associations between referent group specific descriptive, injunctive, and communicative norms and engagement in condomless sex among homeless youth. We hypothesized that youth in our study would nominate a heterogeneous group of people (i.e. family, street peers, home-based peers, partners, and staff) that they perceived as individuals who use condoms, would encourage condom use, or communicate to them about the importance of using condoms.

Additionally, we hypothesized that the relationship between perceived norms and condomless sex would vary as a function of the referent group. Specifically, we anticipated that family and staff influence would be protective; however, perceived influence from peers (i.e. home, street-based, and sex partners) would be the most significant influences on homeless youths' engagement in condomless sex. Moreover, we also expected that one kind of norm (either descriptive, injunctive, or communicative) would have a more salient influence on understanding condomless sex compared to other types of social norms.

Finally, because recent work has noted and emphasized gender differences in social networks of male and female homeless youth, especially regarding engagement in risky sexual behaviors, we also assessed gender differences in social network norms of condomless sex and how these differences would be associated with engagement in condomless sex among this population. Drawing upon limited previous research with populations other than homeless youth, we hypothesized that perceived descriptive norms would have a greater influence on female homeless youth, whereas injunctive norms would be more influential for males. Moreover, in regards to referent group influence, we anticipated that females would be more likely to engage in safe sex communication with non-street based networks as well as sex partners compared to homeless males in our study, and these conversations would be associated with reduced engagement in condomless sex. Finally, we hypothesized that encouragement to use condoms from salient referent groups (such as parents, home-based peers, sex partners) would be associated with engagement in less risky behaviors among males compared to females.

Methods

Procedures

Four waves of cross-sectional data were collected from homeless youths aged 14–25 at two distinct service sites (Hollywood and Venice) in Los Angeles, CA, between October 2011 and June 2013 ($n = 976$). All youth

accessing services at these agencies during the data collection period were invited to participate. Informed consent was obtained from youth ages 18 or older, and informed assent was obtained from youth ages 13–17. The institutional review board of University of Southern California (USC), Los Angeles, waived parental consent because homeless youth younger than age 18 are considered unaccompanied minors, and thus approved all survey items and procedures. Participants received \$20 in cash or gift cards as compensation for their time.

Signed voluntary informed consent or assent, as applicable, was obtained from each youth, with the caveats that child abuse and suicidal and homicidal intentions would be reported. Interviewers received approximately 40 h of training, which included lectures, role-playing, mock surveys, ethics training, and emergency procedures.

The study consisted of two parts: a social network interview and a computerized self-administered survey. The latter included an audio-assisted version for those with lower literacy and could be completed in English or Spanish. The second part of the survey involved a face-to-face, social network-mapping interview conducted by a trained research staff member. The current study chose to employ multiple elicitation questions in the social network interview to prevent recall bias. The following prompt was first read: "Think about the last month. Who have you interacted with? These can be people you interacted with in person, on the phone, or through the Internet." After youth stopped nominating social connections, an additional 15 prompts to solicit nominees were read, and they follow: "These might be friends; family; people you hang out with/chill with/kick it with/have conversations with; people you party with—use drugs or alcohol with; boyfriend/girlfriend; people you are having sex with; baby mama/baby daddy; case worker; people from school; people from work; old friends from home; people you talk to, on the phone or by email; people from where you are staying/squatting with; people you see at this agency; and other people you know from the street." Interviewers paused between each prompt to allow youth to nominate additional social connections before proceeding to the next prompt.

Measures

Engagement in Condomless Sexual Intercourse

Homeless youths' engagement in condomless sexual intercourse was the primary outcome of interest in this research. The outcome variable was assessed through a one-item measure inquiring whether youth had used a condom and/or dental dam in their last episode of sexual intercourse (including vaginal, anal, and oral sex). Youths'

responses of not using a condom and/or dental dam in the last episode of sexual intercourse was coded as one (1), otherwise zero (0).

Perceived Social Network Norms

Condom Use/Safe Sex Descriptive Norms

To assess descriptive norms regarding condom use behaviors or safe sex, after youth finished nominating their network members, they were asked: “Out of the people you nominated, how many of them do you think use condoms or engage in safe sex practices?” Since both theories and research suggests that when it comes to descriptive norms, peer influence is more salient and proximal than the influence exerted through other adult figures [48], we only assessed peer-based descriptive norms for condom use [i.e. sexual partner, a street-based peer, a home-based peer (defined as peer youth participants met from home)]. Network member types were mutually exclusive.

Condom Use/Safe Sex Injunctive Norms

To assess injunctive norms regarding condom use behaviors, after youth finished nominating their network members, they were asked: “Out of the people you nominated, how many of them do you think would encourage you to use condoms or engage in safe sex?” As noted in the literature review, injunctive norms usually emanate from multiple referent groups beyond just one’s peers; therefore, we measured the different types of network members that would encourage condom use (i.e. home-based peers, street-based peers, family members, sexual partner, and staff).

Condom Use/Safe Sex Communication Norms

To assess communication norms regarding condom use behaviors, after youth finished nominating their network members, they were asked: “Out of the people you nominated, who have you spoken to about using condoms/safe sex?” Similar to injunctive norms, we measured the different types of network members with whom youth might have discussed condom use or safe sex practices (i.e. home-based peers, street-based peers, family members, sexual partner, and staff).

To account for varying sized networks, we created network member proportion variables to represent who either engaged in condom use/safe sex, encouraged condom use/safe sex, or communicated about condom use/safe sex, using the total number of network members nominated in the last 90 days as the denominator. However, these proportion variables were skewed as well. Typically, in the

social network literature, skewness is addressed by recoding proportions into categorical variables [10, 19, 22, 23, 30, 38]. The median is then used to create a threshold for measures that are not uniformly distributed [49]. Based on the median, the descriptive norms, injunctive norms, and communication norms were subsequently dichotomized as either no network member (coded as 0), or one or more network members (coded as 1), who participants believed engaged in condom use/safe sex, would encourage condom use/safe sex, or would communicate about condom use/safe sex.

Behavioral Factors

Behavioral factors included engagement in exchange sex, concurrent sexual partnerships, and sexual intercourse under the influence of substances. Exchange sex was assessed using a one-item measure, “Have you ever exchanged sex (oral, vaginal, or anal) for money, drugs, a place to stay, food or meals, or anything else?” (yes = 1/no = 0). Adapted from previous research [50], concurrent sexual partnerships were defined as having more than one sexual partner within a 1-week period in the past 12 months (sample item: In the past 12 months, did you have sex (vaginal or anal sex) with more than one partner in a 1-week period?) (yes = 1/no = 0). Sexual intercourse under the influence of substances was adopted the Youth Risk Behavior Survey [51], a one item measure, “Did you drink alcohol or use drugs before you had sex (vaginal or anal sex) the last time?” (yes = 1/no = 0).

Access to Condoms

Youth participants were asked how frequently they had gone to a place(s) for condoms in the past month. A dichotomous variable was used to measure youth participants’ accessibility to condoms (yes = 1/no = 0).

Demographic Characteristics

Socio-demographic characteristics included age, gender, race/ethnicity, and sexual orientation. Age was measured in years. Gender and sexual orientation were assessed using dichotomous variables (male vs. female; heterosexual vs. non-heterosexual). Race/ethnicity was assessed using a nominal variable (White, Black, Latino/a, and others/mixed).

Analytical Strategy

Analyses were conducted in several steps. First, we conducted a series of descriptive analyses to assess demographic, behavioral, and network norm related

characteristics among our sample. Some participants ($n = 77$) reported not being sexually active and were removed from the analyses. Additionally, 30 youth identified as transgender, and because of their small numbers this group could not be independently included as a separate category, and thus were also excluded from analyses. The final sample was comprised of 869 participants.

Logistic regression analysis was conducted to investigate the relationship between youth participants' engagement in risky sex, and social norms, personal behavioral factors, condom accessibility, and demographic information for the combined sample. Because this was largely exploratory analysis, a two-step data analysis strategy was utilized to select variables that were included in multivariate analyses. Bivariate analyses were first conducted to examine unadjusted associations between study variables and outcome measures for the non-stratified model. Any variables that were significantly associated with the outcome at $p < 0.05$ were retained in the multivariate model for the non-stratified model. Multivariate models were then constructed based on these analyses [52]. Control variables were included in the multivariate model, regardless of being significantly associated or not with the outcome variable.

In order to examine gender differences in behavioral and social network norms, these variables were stratified by gender (i.e. male and female). Because we wanted to focus on gender differences in both behavioral as well as social network norm characteristics among this sample, χ^2 tests and t tests were computed to assess unadjusted relationships between several sociodemographic, behavioral, perceived norms variables, and gender. To assess independent associations between independent variables and self-reported engagement in condomless sex, logistic regression was conducted, controlling for other salient sociodemographic indicators such as age and race/ethnicity for males and females separately. Only variables that were significant in bivariate analysis (i.e. if there were significant differences in any independent variables of interest by gender) were included in final analyses. Variance inflation factor (VIF) was assessed to determine the potential multicollinearity among the independent variables.

Results

Table 1 demonstrates the demographic and social network norm characteristics of homeless youth included in the study. The sample was predominantly composed of males (71.92%). Average age of participants was 21.36 years. A majority of youth self-identified as heterosexual (76.62%). Whites comprised the largest racial/ethnic group (38.43%). More than one-third of the youth reported concurrent

sexual partnerships (36.82%). More worryingly, slightly less than half (43.13%) of youth indicated that they had engaged in sex under the influence of drugs. Around 17.49% of youth reported engaging in exchange sex. Rates of condomless sexual intercourse were also high: approximately two-thirds (67.68%) of youth reported not using condom/dental dam in their last sexual intercourse.

Regarding descriptive norms, less than half of youth (43.50%) believed that at least one of their street peers used condoms or engaged in safe sex, more than half of youth (53.62%) believed that at least one of their home-based peers used condoms or engaged in safe sex, and a little more than one-fourth of youth believed that their sexual partner used condoms or engaged in safe sex (29.34%).

In terms of injunctive norms, youth reported receiving encouragement to use condoms or engage in safe sex from numerous sources. More youth thought their home-based peers (72.73%) would encourage condom use or safe sex practices compared to family or relatives (61.22%) and street-based peers (52.01%). More than one-third of youth (35.44%) believed their sexual partner would encourage them to engage in safe sex. Just less than one-fourth of youth (22.67%) believed that at least one caseworker would encourage them to use condoms or engage in safe sex.

Similar to injunctive norms, youth reported communicating to different relationship types about the importance of using condoms or engaging in safe sex. Less than half of youth reported talking to their street peers (41.64%) or their home-based peers (42.33%) about condoms/safe sex. Almost one-third of youth reported talking to their sex partners (31.42%) and their family members (36.13%) about condom use/safe sex. Less than one-tenth of youth reported talking to their caseworkers about condoms/safe sex (7.83%).

Table 2 shows the results of bivariate logistic regression analyses. Respondents' engagement in concurrent sexual partnerships (OR 2.01; 95% CI 1.45–2.80), exchange sex (OR 2.39; 95% CI 1.53–3.74), having at least one sex partner with whom youth talk about condom use or safe sex (OR 2.12; 95% CI 1.20–3.71), and having at least one street peer whom youth believe use condoms or engaged in safe sex were found to be significantly associated with engagement in condomless sex (OR 0.53; 95% CI 0.32–0.88). These significant variables were therefore included in the final model along with control variables (e.g., age, gender, race/ethnicity, sexual orientation).

Table 3 illustrates the multivariate logistic regression analysis for the non-stratified sample. Regarding demographic and behavioral characteristics, gender (OR 0.45; 95% CI 0.29–0.68), engagement in concurrent sexual partnerships (OR 1.60; 95% CI 1.01–2.32), sex trade or exchange sex (OR 1.89; 95% CI 1.13–3.12), and accessing

Table 1 Homeless youth participants' demographic characteristics and perceived social norms (n = 869)

Variables	n (%)
Outcome	
Unprotected sex during last sexual intercourse ^a	559 (67.68)
Respondent demographic characteristics	
Age (M/SD) ^b	21.36 (2.13)
Gender (male) ^c	612 (71.92)
Race^d	
White	334 (38.43)
Black	205 (23.59)
Latino/a	118 (13.58)
Others	193 (22.21)
Sexual orientation (reference: non-heterosexual) ^e	624 (74.64)
Individual behavioral factors	
Concurrent sexual partnerships ^f	296 (36.82)
Sex trade ^g	145 (17.49)
Sexual intercourse under the influence of substances ^h	358 (43.13)
Condom accessibility	
Accessed condoms in the past 30 days ⁱ	265 (32.56)
Social Norms	
Condom use descriptive norms	
Have at least one sex partner uses condoms/engages in safe sex	255 (29.34)
Have at least one home-based peer uses condoms/engages in safe sex	466 (53.62)
Have at least one street-based peer uses condoms/engages in safe sex	378 (43.50)
Condom use injunctive norms	
Have at least one sex partner who would encourage condom use/safe sex	308 (35.44)
Have at least one case worker who would encourage condom use	197 (22.67)
Have at least one home-based peer who encourage condom use/safe sex	632 (72.73)
Have at least one relative who would encourage condom use/safe sex	532 (61.22)
Have at least one street peer who would encourage condom use/safe sex	452 (52.01)
Condom use communication norms	
Have at least one sex partner who talked about condom use/safe sex	273 (31.42)
Have at least one case worker who talked about condom use/safe sex	68 (7.83)
Have at least one home-based peer who talked about condom use/safe sex	449 (51.67)
Have at least one relative who talked about condom use/safe sex	314 (36.13)
Have at least one street peer who talked about condom use/safe sex	290 (33.37)

^a N = 826^b N = 850^c N = 851^d N = 869^e N = 836^f N = 804^g N = 829^h N = 830ⁱ N = 814

condoms in the past 30 days (OR 0.66; 95% CI 0.47–0.94), were all associated with engagement in condomless sex among this population. In regards to social network norm variables, perceiving that at least one street peer uses condoms or engages in safer sex was associated with a

lower likelihood of engaging in condomless sex (OR 0.55; CI 0.36–0.83). Surprisingly, communicating with a sex partner about condoms or safe sex was associated with an increased likelihood of engaging in condomless sex (OR 1.71, CI 1.11–2.65).

Table 2 Bivariate logistic regression analysis for correlates of homeless youth's last unprotected sexual intercourse

Variables	Unprotected sex	
	Adj. OR	95% CI
Respondent demographic characteristics		
Age	0.97	0.91–1.04
Gender (reference: male)	0.65*	0.45–0.92
Race (reference: white)		
African-American/Black	0.39***	0.27–0.57
Latino	0.54**	0.34–0.85
Other race	0.63*	0.43–0.94
Sexual orientation (reference: non-heterosexual)	0.74	0.53–1.03
Individual behavioral factors		
Concurrent sexual partnerships	2.01***	1.45–2.80
Sex trade	2.39***	1.53–3.74
Sexual intercourse under the influence of substances	1.64***	1.21–2.22
Condom accessibility		
Accessed condoms in the past 30 days	0.68*	0.50–0.93
Social norms		
Condom use descriptive norms		
Have at least one street-based peer uses condoms/engages in safe sex	0.56***	0.42–0.76
Have at least one home-based peer uses condoms/engages in safe sex	0.57***	0.42–0.77
Have at least one sex-partner uses condoms/engages in safe sex	0.71*	0.52–0.98
Condom use injunctive norms		
Have at least one sex partner who would encourage condom use/safe sex	1.03	0.76–1.40
Have at least one shelter staff member who would encourage condom use/safe sex	0.81	0.57–1.14
Have at least one home-based peer who encourage condom use/safe sex	0.74	0.53–1.04
Have at least one relative who would encourage condom use/safe sex	1.01	0.75–1.37
Have at least one street peer who would encourage condom use/safe sex	0.72	0.53–0.96
Condom use communication norms		
Have at least one sex partner who talked about condom use/safe sex	1.26*	1.01–1.73
Have at least one shelter staff member who talked about condom use/safe sex	0.7	0.42–1.17
Have at least one home-based peer who talked about condom use/safe sex	0.8	0.59–1.06
Have at least one relative who talked about condom use/safe sex	0.81	0.60–1.10
Have at least one street peer who talked about condom use/safe sex	0.81	0.59–1.09

OR odds ratio, CI confidence interval

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, **** $p < 0.0001$

Table 4 presents comparative descriptive and social network variable analysis by gender. These results indicate that females were more likely to engage in condomless sex compared to males (73.00 vs. 64.00%), although were less likely to engage in sexual intercourse under the influence of substances (29.26 vs. 48.42%). Regarding perceived network norm characteristics, there were important and significant gender differences in descriptive, injunctive, and communicative norm characteristics. Females were more likely to report that that their sex partner (39.75 vs. 31.54%), or a street peer uses condoms (48.95 vs. 41.50%), compared to males. Females were also more likely to

perceive that their sex partner would encourage them to use condoms (45.19 vs. 31.54%) compared to males. In regards to safe sex communication, females were more likely to report that they had talked to at least one sex partner (46.03 vs. 25.82%), at least one home-based peer (63.18 vs. 46.73%), one relative (43.51 vs. 32.84%) and one street-based peer about condoms or safe sex (48.54 vs. 27.45%).

Table 5 highlights the results of the multivariate analysis stratified by gender. Among male homeless youth, African-American males were less likely to engage in condomless sex (OR 0.42; 95% CI 0.26–0.70). However, male youth, in general, were more likely to engage in

Table 3 Multivariate logistic regression analysis for correlates of homeless youth's last unprotected sexual intercourse

Variables	Unprotected sex	
	Adj. OR	95% CI
Respondent demographic characteristics		
Age	0.96	0.89–1.04
Gender (reference: male)	0.45*	0.29–0.68
Race (reference: white)		
African-American/Black	0.69	0.46–1.03
Latino	0.61	0.36–1.03
Other race	0.71	0.45–1.10
Sexual orientation (reference: non-heterosexual)	0.74	0.48–1.14
Individual behavioral factors		
Concurrent sexual partnerships	1.60**	1.01–2.32
Sex trade	1.89**	1.13–3.12
Sexual intercourse under the influence of substances	1.41	0.99–2.01
Condom accessibility		
Accessed condoms in the past 30 days	0.66**	0.47–0.94
Social norms		
Condom use descriptive norms		
Have at least one street based peer uses condoms/safe sex	0.55**	0.36–0.83
Have at least one home based peer uses condoms/safe sex	0.72	0.49–1.04
Have at least one sex-partner uses condoms/safe sex	0.69	0.44–1.11
Condom use communication norms		
Have at least one sex partner that would communicate condom use/safe sex	1.71**	1.11–2.65
n	769	
AIC	868.28	
SC	937.51	
2logL	838.28	
Wald χ^2 (df)	68.88****(14)	
Nagelkerke R ²	0.15	

OR odds ratio, CI confidence interval, AIC Akaike information criterion, SC Schwarz criterion, df degrees of freedom

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, **** $p < 0.0001$

condomless sex when under the influence of substances (OR 1.71; 95% CI 1.14–2.56). In terms of network norm characteristics, only one characteristic, having at least one street peer who used condoms or practiced safer sex, was associated with a lower likelihood of engaging in condomless sex (OR 0.65; 95% CI 0.43–0.98).

Among females, engaging in sex trade increased the likelihood of engaging in condomless sex (OR 3.97; 95% CI 1.22–12.98). Having accessed condoms decreased the likelihood of female youth engaging in condomless sex (OR 0.48; CI 0.24–0.99). Regarding network norm characteristics, having at least one street-based peer (OR 0.36; 95% CI 0.15–0.83) and having a sex partner (OR 0.23; 95% CI 0.07–0.072) who uses condoms or practices safer sex was associated with decreased likelihood of engaging in condomless sex. In contrast, for female homeless youth,

communicating with a sex partner about condoms or safer sex (OR 3.84; 95% CI 1.34–11.00) was associated with an increased likelihood of engaging in condomless sex.

Discussion

To the best of our knowledge, this is the first study to investigate the relative influence of descriptive, injunctive, and communication norms regarding condomless sex among homeless youth. Second, this is also the first study to further specify the referent groups from which these norms emanate, and how these different referent groups might influence youths' perceptions of what is considered normative behavior, which subsequently influences engagement in sexual risk or protective behaviors. Finally,

Table 4 Homeless youth participants' demographic characteristics and perceived social norms stratified by gender

Variables	Male		Female		χ^2/t test
	n	%	n	%	
Outcome					
Unprotected sex during last sexual intercourse	392	64	167	73	3.77*
Respondent demographic characteristics					
Race					
White	251	41.01	83	34.73	2.84
Black	143	23.37	62	25.94	0.62
Latino/a	85	13.89	33	13.81	0.001
Others	132	21.57	61	25.52	1.53
Sexual orientation (reference: non-heterosexual)	501	83.5	123	52.12	88.12****
Individual behavioral factors					
Concurrent sexual partnerships	224	37.62	72	32.14	2.91
Sex trade	104	17.39	41	17.75	0.01
Sexual intercourse under the influence of substances	291	48.42	67	29.26	24.82****
Condom accessibility					
Accessed condoms in the past 30 days	189	32.25	76	33.33	0.08
Social norms					
Condom use descriptive norms					
Have at least one sex partner uses condoms/engages in safe sex	154	25.16	95	39.75	17.66****
Have at least one home-based peer uses condoms/engages in safe sex	317	51.8	140	58.58	3.17
Have at least one street-based peer uses condoms/engages in safe sex	254	41.5	117	48.95	3.88*
Condom use injunctive norms					
Have at least one sex partner who would encourage condom use/safe sex	193	31.54	108	45.19	14.01***
Have at least one case worker who would encourage condom use	127	20.75	64	26.78	3.48
Have at least one home-based peer who encourage condom use/safe sex	438	71.57	180	75.31	1.21
Have at least one relative who would encourage condom use/safe sex	366	59.8	154	64.44	1.55
Have at least one street peer who would encourage condom use/safe sex	307	50.16	134	56.07	2.39
Condom use communication norms					
Have at least one sex partner who talked about condom use/safe sex	158	25.82	110	46.03	35.53****
Have at least one case worker who talked about condom use/safe sex	43	7.03	25	10.46	2.75
Have at least one home-based peer who talked about condom use/safe sex	286	46.73	151	63.18	18.61****
Have at least one relative who talked about condom use/safe sex	201	32.84	104	43.51	8.5***
Have at least one street peer who talked about condom use/safe sex	168	27.45	116	48.54	34.36****

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, **** $p < 0.0001$

by exploring gender differences in network norms of condomless sex, this study highlights the importance of gender roles and relations in understanding sexual risk behaviors, and provides direction for gender-responsive programming to reduce rates of condomless sex among this at-risk population.

Findings from Non-stratified Analyses

Homeless youth in the study reported high rates of engagement in condomless sex at last sexual intercourse (67.68%). This is consistent with previous research, which

found that 40–70% of homeless youth reported engagement in condomless intercourse [4, 7, 10]. Since our findings indicate that youth are also engaging in other risky sexual behaviors, such as concurrent sex and exchanging sex for money and other needed resources, it is especially pertinent that interventions are designed which can better engage this population around these sexual risks. Moreover, researchers and providers have alternatively explored the possibility of using PrEP as a HIV prevention strategy for this group of youth. However, no research has been conducted to document whether PrEP is acceptable or accessible to this group of youth [53]. More importantly, while PrEP can

Table 5 Multivariate logistic regression analysis for correlates of homeless youth's last unprotected sexual intercourse (by gender)

Variables	Unprotected sex			
	Male		Female	
	Adj. OR	95% CI	Adj. OR	95% CI
Respondent demographic characteristics				
Age	0.94	0.86–1.03	1.03	0.86–1.22
Race (reference: White)				
African-American/Black	0.42***	0.26–0.70	0.44	0.18–1.09
Latino	0.77	0.41–1.45	0.45	0.16–1.28
Other race	0.67	0.40–1.13	0.91	0.34–2.39
Sexual orientation (reference: non-heterosexual)	0.71	0.39–1.26	0.65	0.32–1.32
Individual behavioral factors				
Concurrent sexual partnerships	1.63*	1.06–2.52	1.96	0.85–4.52
Sex trade	1.48	0.83–2.67	3.97*	1.22–12.98
Sexual intercourse under the influence of substances	1.71**	1.14–2.56	0.92	0.41–2.05
Condom accessibility				
Accessed condoms in the past 30 days	0.73	0.48–1.10	0.48*	0.24–0.99
Social Norms				
Condom use descriptive norms				
Have at least one street-based peer who uses condoms/safe sex	0.65*	0.43–0.98	0.36*	0.15–0.83
Have at least one sex-partner who uses condoms/safe sex	0.71	0.37–1.33	0.23*	0.07–0.72
Condom use injunctive norms				
Have at least one sex partner who would encourage condom use/safe sex	1.21	0.70–2.08	0.83	0.36–1.93
Condom use communication norms				
Have at least one sex partner who talked about condom use/safe sex	1.19	0.65–2.20	3.84*	1.34–11.00
Have at least one home-based peer who talked about condom use/safe sex	0.86	0.49–1.49	0.49	0.18–1.34
Have at least one relative who talked about condom use/safe sex	1.3	0.74–2.28	0.85	0.35–2.06
Have at least one street peer who talked about condom use/safe sex	0.74	0.45–1.22	1.11	0.44–2.81
n	532		214	
AIC	650.02		235.32	
SC	722.73		292.54	
2logL	616.02		201.32	
Wald χ^2 (df)	45.28****(16)		34.58****(16)	
Nagelkerke R ²	0.13		0.25	

OR odds ratio, CI confidence interval, AIC Akaike information criterion, SC Schwarz criterion, df degrees of freedom

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, **** $p < 0.0001$

be instrumental in preventing HIV, it still does nothing to curb the prevalence of unintended pregnancies and other STDs among this population.

Consistent with previous research [40], descriptive norms regarding condom use were found to be significantly associated with condom use among this sample of youth. However, results indicate that street peers seem to be a more influential referent group for homeless youth compared to their home-based peers as it relates to their engagement in condomless sex. Notably, youth who believed that their street peers used condoms were less

likely to engage in condomless sex. Extant theories of peer influence have suggested that the degree to which a peer affects behavioral decisions depends on the proximity of the relationship [54, 55]. Street peers might therefore be more salient influences in the context of homeless youths' condom use decision-making behaviors, as youth are perhaps more likely to meet their street peers more frequently as well as face-to-face, compared to their home-based peers, discuss their sexual risk-reduction practices, and share similar stressors associated with their homelessness. Therefore, street peers may wield stronger influence

specifically as a function of these contextual factors and more prevalent face-to-face interactions.

Furthermore, previous studies suggest that non-street relationships seem to be more critical in understanding homeless youths' stability-seeking behaviors (such as housing, employment, and service utilization) [56–58]. On the other hand, influence from street peers seems to be more salient in understanding engagement in risky or protective behaviors (such as condom and substance use) [40, 59, 60]. Therefore, in designing social network interventions for homeless youth, these interventions may need to be tailored depending on the behaviors that the intervention is attempting to change. For example, if the goal of an intervention is to change patterns of condom use, then street peers might be more salient intervention agents relative to other network members. Conversely, if the objective of an intervention is to move homeless youth out of their street existence and into more stable circumstances, connecting youth to non-street relationships might be the more prudent path.

It is also important to note that none of the injunctive norm variables were significantly associated with condomless sex. As aforementioned, extant research suggests that the relative influence of descriptive versus injunctive norms differs based on the behavior being examined. Therefore, these findings suggest that descriptive norms seem to be more impactful in understanding condomless sex. As such, in planning interventions to reduce condomless sex, it might be more critical to use “normative feedback” to change perceptions of descriptive norms rather than injunctive norms.

Only one communicative norm variable was significantly associated with condomless sex. Surprisingly, talking to one's sexual partner about condoms or safe sex practices was associated with a greater likelihood of engaging in condomless sex. While unexpected, this is consistent with a previous study on homeless youth [12] and college students [61], which reported similar results. Kennedy et al. [12] concluded that the use of condoms might prevent youth from developing close, intimate, trustful, and committed relationships with their primary sexual partner. This finding may somewhat paradoxically suggest that youth may perceive the benefits of maintaining a stable relationship as outweighing the costs associated with the potential risks of getting pregnant or contracting STIs/HIV [12].

An alternative explanation could be that when sexual partners talk about condom use, it could also indicate that they are discussing their sexual history [61]. This may lead to erroneous assumptions about the potential of contracting sexually transmitted infections within that relationship [61]. Moreover, youth who are in long-term relationships, which they perceive to be monogamous, might rely on

other contraceptive methods, which may protect against pregnancy but not STIs and HIV [61]. Future intervention strategies may also increase focus on the importance of maintaining open communication about frequent, updated HIV/STI testing among serious partners to ensure that accurate health status is consistently known and trusted within close relationships. Future strategies may also increase focus on the importance of maintaining open communication about frequent, updated HIV/STI testing among serious partners to ensure that accurate health status is consistently known and trusted within close relationships.

Additionally, it is possible that there could be potential temporal confounders that explain this paradoxical relationship, which is not captured by our reliance on cross-sectional data. For example, it is possible that youth may have talked to their partners about using condoms but decided based on the conversation that it was safe to engage in condomless sex. It is also likely that they might have engaged in unprotected sex before having a conversation about safe sex. Clearly, longitudinal research is needed to clarify the temporal ordering of these variables.

Gender Differences in Social Network Norms of Homeless Youth

Our findings indicate that, as anticipated, there are important and significant gender differences in social network norms of homeless youth, which may play a role in the differences in sexual risk behaviors among male and female homeless youth and young adults. For example, while street peer based descriptive norms were significantly associated with condomless sex among both male and female homeless youth, reporting that a sex partner would use condoms was associated with a reduced likelihood of engaging in condomless sex only among female homeless youth. In contrast, talking to a sex partner about condoms or safe sex, while not significant among male homeless youth, was significantly associated with increased engagement in condomless sex among female homeless youth.

Considered together, such evidence may perhaps be conceptualized through differentials in gender-based norms and power disequilibria. Such power differentials may place young homeless women at risk of engaging in HIV risk behaviors in response to feeling pressured to adhere to male partners' desires to not use condoms during sex [62]. Additionally, female homeless youth are often dependent upon their male partners for shelter and protection and thus are more likely to engage in condomless sex if preferred by their partner(s) [5, 38, 41]. Moreover, young homeless women are often characterized as having goals of building intimacy within their sexual relationships, a factor that is

associated with having a lower number of sex partners, but also a higher rate of condomless sex within an intimate relationship [5].

It is important to note that our sample also included women who had sex with women or identified as lesbians, bisexual, or queer. While the gender power differentials as noted above are more typical of heterosexual relationships, such phenomena might also affect LBQ female homeless youth, but in different ways. For example, studies have found women who have sex with other women (WSW) were more likely than non-WSW to engage in high-risk behaviors of condomless sex with men, and exchange sex [63]. This might be especially true for young female homeless youth who often engage in sex-trade (with men) to meet their basic needs and might not have the power to negotiate safer sex practices. This is also consistent with our own findings, which indicate that while engaging in sex trade was not significant for males, it was significantly associated with engagement in condomless sex. Moreover, WSW and bisexual women often erroneously believe that they are immune to STIs and HIV [64], or find dental dams too difficult to use, thereby increasing their rates of engagement in condomless sex.

Our findings indicate that sexual risk reduction programs need to be tailored to be more gender-responsive. Our results suggest that among males, engagement in safe sex is more motivated by perceived peer use than other factors. However, among females, who are often dependent on other men and have limited control over their sexual behavior, it might be difficult for them to modify their behaviors and therefore perceptions of peer use might not be enough to allow them to make these changes [19]. Our results suggest that for females, even when they are communicating about engaging in safe sex with their partners, may lack the ability to assert their decisions on their partners. A recent meta-analysis of HIV prevention interventions for African American women found that the studies that showed greatest promise were ones that incorporated gender specific content and addressed issues of empowerment, effective strategies for negotiating safer sex, and utilized role-playing techniques to practice these newly learned strategies [65, 66]. Therefore, there may be utility in including these strategies for female homeless youth as well.

Study Limitations

Like any other study, this study comes with certain limitations, which might influence the interpretation of findings. This study is cross-sectional; therefore, no causality can be inferred about its findings. Longitudinal research could further help us elucidate the pathways through which network dynamics operate over time in order to understand

the development of norms and their effects on condom use behaviors among this population. Second, we combined multiple cross-sectional data, which was collected over time from the same drop-in centers. To avoid duplication of surveys, a consistent set of two research staff members were assigned to supervise the recruitment and data collection process throughout the 2 years of the study. However, we do realize that even with such robust gatekeeping procedures, there is still a potential for youth to be accidentally interviewed more than once. Also, all the network norm variables are perceptual; there is no independent confirmation of these norms from network members. Therefore, it is possible that youth are projecting their own behaviors to their network members. Studies, however, suggest that even when these perceptions are biased, they still influence behavior [12, 67], and are thus important to investigate. Additionally, all behavioral data are derived from self-reports; accordingly, there is potential for social desirability bias. However, we believe that we were able to minimize such bias with the use of computer-assisted self-interviews. Furthermore, it was inferred that non-street ties are a source of positive influence, whereas previous studies have found that relationships from home are generally more protective [28]. However, no data were collected regarding the nature of these ties and the content of these social exchanges. Moreover, there are other network attributes (such as having network members who use drugs or those who attend school) that are also known to be associated with condomless sex among homeless youth. Because of the need to focus on a finite set of variables, we could not include these variables in our analyses. Finally, the youth in this sample were recruited at drop-in centers in a large urban region and therefore may not be representative of homeless youth populations, particularly those who are non-service seeking and/or homeless youth in rural areas.

Conclusions

The findings from this study provide preliminary yet important evidence that the understanding of social norms can help us understand a broad range of human behaviors, including that of condomless sex among this very high-risk population. This study provides further evidence that the “social context” might be critical to engagement in sexual risk behaviors. Recent reviews suggest that most HIV prevention programs that have had an individualistic focus [68] may explain why many HIV interventions have had less than favorable outcomes. Findings from this and previous studies strongly indicate that there is a need for innovative network-level interventions, particularly those that include street-based peers and sex partner dyads, as

well tailored gender-responsive programs, as such approaches may hold the greatest promise for reducing HIV incidence among homeless youth.

Funding This study was funded by NIMH (R01 MH093396).

Compliance with Ethical Standards

Conflict of interest All the authors of this study have no conflict of interest to report.

Informed Consent The Institutional Review Board at the University of Southern California approved all survey items and procedures. Informed consent was obtained from youth ages 18 or older, and informed assent was obtained from youth ages 13–17. The institutional review board of University of Southern California, Los Angeles waived parental consent because homeless youth younger than age 18 are considered unaccompanied minors.

Research Involving Human Participants and/or Animals All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

References

- Pfeifer RW, Oliver J. A study of HIV seroprevalence in a group of homeless youth in Hollywood, California. *J Adolesc Health*. 1997;20(5):339–42.
- Linton SL, Celentano DD, Kirk GD, Mehta SH. The longitudinal association between homelessness, injection drug use, and injection-related risk behavior among persons with a history of injection drug use in Baltimore, MD. *Drug Alcohol Depend*. 2013;132(3):457–65.
- Halcón LL, Lifson AR. Prevalence and predictors of sexual risks among homeless youth. *J Youth Adolesc*. 2004;33(1):71–80.
- Haley N, Roy É, Leclerc P, Boudreau JF, Boivin JF. HIV risk profile of male street youth involved in survival sex. *Sex Transm Infect*. 2004;80(6):526–30.
- Tevendale HD, Lightfoot M, Slocum SL. Individual and environmental protective factors for risky sexual behavior among homeless youth: an exploration of gender differences. *AIDS Behav*. 2009;13(1):154–64.
- Centers for Disease Control and Prevention. Condoms and STDs: fact sheet for public health personnel. Division of HIV/AIDS prevention. National Center for HIV/AIDS, viral hepatitis, STD, and TB prevention, Centers for Disease Control and Prevention. 2013. <http://www.cdc.gov/condomeffectiveness/latex.htm>.
- Solorio MR, Rosenthal D, Milburn NG, Weiss RE, Batterham PJ, Gandara M, et al. Predictors of sexual risk behaviors among newly homeless youth: a longitudinal study. *J Adolesc Health*. 2008;42(4):401–9.
- Tucker JS, Wenzel SL, Golinelli D, Kennedy DP, Ewing B, Wertheimer S. Understanding heterosexual condom use among homeless men. *AIDS Behav*. 2013;17(5):1637–44.
- Marshall BD, Kerr T, Shoveller JA, Patterson TL, Buxton JA, Wood E. Homelessness and unstable housing associated with an increased risk of HIV and STI transmission among street-involved youth. *Health Place*. 2009;15(3):783–90.
- Tucker JS, Ryan GW, Golinelli D, Ewing B, Wenzel SL, Kennedy DP, Green HD Jr, Zhou A. Substance use and other risk factors for unprotected sex: results from an event-based study of homeless youth. *AIDS Behav*. 2012;16(6):1699–707.
- Slesnick N, Kang MJ. The impact of an integrated treatment on HIV risk behavior among homeless youth: a randomized controlled trial. *J Behav Med*. 2008;31(1):45–59.
- Kennedy DP, Wenzel SL, Brown R, Tucker JS, Golinelli D. Unprotected sex among heterosexually active homeless men: results from a multi-level dyadic analysis. *AIDS Behav*. 2013;17(5):1655–67.
- Ream GL, Barnhart KF, Lotz KV. Decision processes about condom use among shelter-homeless LGBT youth in Manhattan. *AIDS Res Treat*. 2012;27:2012.
- Clements K, Gleghorn A, Garcia D, Katz M, Marx R. A risk profile of street youth in northern California: implications for gender-specific human immunodeficiency virus prevention. *J Adolesc Health*. 1997;20(5):343–53.
- DeMatteo D, Major C, Block B, Coates R, Fearon M, Goldberg E, King SM, Millson M, O'Shaughnessy M, Read SE. Toronto street youth and HIV/AIDS: prevalence, demographics, and risks. *J Adolesc Health*. 1999;25(5):358–66.
- Melander LA, Tyler KA, Schmitz RM. An inside look at homeless youths' social networks: perceptions of substance use norms. *J Child Adolesc Subst Abuse*. 2016;25(1):78–88.
- Rice E. The positive role of social networks and social networking technology in the condom-using behaviors of homeless young people. *Public Health Rep*. 2010;1:588–95.
- Young SD, Rice E. Online social networking technologies, HIV knowledge, and sexual risk and testing behaviors among homeless youth. *AIDS Behav*. 2011;15(2):253–60.
- Davey-Rothwell MA, Latkin CA. Gender differences in social network influence among injection drug users: perceived norms and needle sharing. *J Urban Health*. 2007;84(5):691–703.
- Friedkin NE. Norm formation in social influence networks. *Soc Netw*. 2001;23(3):167–89.
- Kincaid DL. From innovation to social norm: bounded normative influence. *J Health Commun*. 2004;9(S1):37–57.
- Barrington C. Social networks, norms, and HIV-related behaviors among the male partners of female sex workers in La Romana, Dominican Republic (Doctoral dissertation, The Johns Hopkins University).
- Tyler KA. Homeless youths' HIV risk behaviors with strangers: investigating the importance of social networks. *Arch Sex Behav*. 2013;42(8):1583–91.
- Okun MA, Ruehlman L, Karoly P, Lutz R, Fairholme C, Schaub R. Social support and social norms: do both contribute to predicting leisure-time exercise? *Am J Health Behav*. 2003;27(5):493–507.
- Rimal RN, Real K. Understanding the influence of perceived norms on behaviors. *Commun Theory*. 2003;13(2):184–203.
- Latkin CA, Forman V, Knowlton A, Sherman S. Norms, social networks, and HIV-related risk behaviors among urban disadvantaged drug users. *Soc Sci Med*. 2003;56(3):465–76.
- 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(5):697–704.
- Rice E, Stein JA, Milburn N. Countervailing social network influences on problem behaviors among homeless youth. *J Adolesc*. 2008;31(5):625–39.
- Wenzel S, Holloway I, Golinelli D, Ewing B, Bowman R, Tucker J. Social networks of homeless youth in emerging adulthood. *J Youth Adolesc*. 2012;41(5):561–71.
- Latkin C, Donnell D, Celentano DD, Aramrattana A, Liu TY, Vongchak T, Wiboonnatakul K, Davis-Vogel A, Metzger D. Relationships between social norms, social network

- characteristics, and HIV risk behaviors in Thailand and the United States. *Health Psychol.* 2009;28(3):323.
31. Rimal RN, Lapinski MK, Cook RJ, Real K. Moving toward a theory of normative influences: how perceived benefits and similarity moderate the impact of descriptive norms on behaviors. *J Health Commun.* 2005;10(5):433–50.
 32. Festinger L. A theory of social comparison processes. *Hum Relat.* 1954;7(2):117–40.
 33. Borsari B, Carey KB. Descriptive and injunctive norms in college drinking: a meta-analytic integration. *J Stud Alcohol.* 2003;64(3):331–41.
 34. Carey KB, Borsari B, Carey MP, Maisto SA. Patterns and importance of self-other differences in college drinking norms. *Psychol Addict Behav.* 2006;20(4):385.
 35. Cho H. Readiness to change, norms, and self-efficacy among heavy-drinking college students. *J Stud Alcohol.* 2006;67(1):131–8.
 36. Rosenthal D, Rotheram-Borus MJ, Batterham P, Mallett S, Rice E, Milburn NG. Housing stability over two years and HIV risk among newly homeless youth. *AIDS Behav.* 2007;11(6):831–41.
 37. Solorio MR, Milburn NG, Rotheram-Borus MJ, Higgins C, Gelberg L. Predictors of sexually transmitted infection testing among sexually active homeless youth. *AIDS Behav.* 2006;10(2):179–84.
 38. Valente AM, Auerswald CL. Gender differences in sexual risk and sexually transmitted infections correlate with gender differences in social networks among San Francisco homeless youth. *J Adolesc Health.* 2013;53(4):486–91.
 39. Tyler KA, Whitbeck LB, Chen X, Johnson K. Sexual health of homeless youth: prevalence and correlates of sexually transmissible infections. *Sex Health.* 2007;4(1):57–61.
 40. Rice E, Barman-Adhikari A, Milburn NG, Monro W. Position-specific HIV risk in a large network of homeless youths. *Am J Public Health.* 2012;102(1):141–7.
 41. Bourgois P, Prince B, Moss A. The everyday violence of hepatitis C among young women who inject drugs in San Francisco. *Hum Organ.* 2004;63(3):253–64.
 42. Montgomery SB, Hyde J, De Rosa CJ, Rohrbach LA, Ennett S, Harvey SM, Clatts M, Iverson E, Kipke MD. Gender differences in HIV risk behaviors among young injectors and their social network members. *Am J Drug Alcohol Abuse.* 2002;28(3):453–75.
 43. Mizuno Y, Seals B, Kennedy M, Myllyluoma J. Predictors of teens' attitudes toward condoms: gender differences in the effects of norms. *J Appl Soc Psychol.* 2000;30(7):1381–95.
 44. Corby NH, Jamner MS, Wolitski RJ. Using the theory of planned behavior to predict intention to use condoms among male and female injecting drug users. *J Appl Soc Psychol.* 1996;26(1):52–75.
 45. Noar SM, Carlyle K, Cole C. Why communication is crucial: meta-analysis of the relationship between safer sexual communication and condom use. *J Health Commun.* 2006;11(4):365–90.
 46. Widman L, Choukas-Bradley S, Helms SW, Golin CE, Prinstein MJ. Sexual communication between early adolescents and their dating partners, parents, and best friends. *J Sex Res.* 2014;51(7):731–41.
 47. Wenzel SL, Cederbaum JA, Song A, Hsu HT, Craddock JB, Hantanaichikul W, Tucker JS. Pilot test of an adapted, evidence-based HIV sexual risk reduction intervention for homeless women. *Prev Sci.* 2016;17(1):112–21.
 48. McKechnie ML, Bavinton BR, Zablotska IB. Understanding of norms regarding sexual practices among gay men: literature review. *AIDS Behav.* 2013;17(4):1245–54.
 49. Wang L, Fan X, Willson VL. Effects of nonnormal data on parameter estimates and fit indices for a model with latent and manifest variables: an empirical study. *Struct Equ Model.* 1996;3(3):228–47.
 50. Chantala K, Tabor J. National longitudinal study of adolescent health: strategies to perform a design-based analysis using the add health data. 1999.
 51. Kann L, McManus T, Harris WA, et al. Youth risk behavior surveillance—United States, 2015. *MMWR Surveill Summ.* 2016;65(6):1–174. <http://dx.doi.org/10.15585/mmwr.ss6506a1>.
 52. Hosmer DW Jr, Lemeshow S. *Applied logistic regression.* New York: Wiley; 2004.
 53. Burda JP. PrEP and our youth: implications in law and policy. *Columbia J Gend Law.* 2016;1(30):295–549.
 54. Bearman PS. *Social network context and adolescent STD risk.* New York: Institute for Social and Economic Research and Policy, Columbia University; 2002.
 55. Paek H. Differential effects of different peers: further evidence of the peer proximity thesis in perceived peer influence on college students' smoking. *J Commun.* 2009;59(3):434–55.
 56. Barman-Adhikari A, Rice E. Social networks as the context for understanding employment services utilization among homeless youth. *Eval Program Plan.* 2014;31(45):90–101.
 57. Curry SR, Rhoades H, Rice E. Correlates of homeless youths' stability-seeking behaviors online and in person. *J Soc Soc Work Res.* 2016;7(1):143–76.
 58. Rice E, Barman-Adhikari A. Internet and social media use as a resource among homeless youth. *J Comput Mediat Commun.* 2014;19(2):232–47.
 59. Barman-Adhikari A, Rice E, Winetrobe H, Petering R. Social network correlates of methamphetamine, heroin, and cocaine use in a sociometric network of homeless youth. *J Soc Soc Work Res.* 2015;6(3):433–57.
 60. Barman-Adhikari A, Begun S, Rice E, Yoshioka-Maxwell A, Perez-Portillo A. Sociometric network structure and its association with methamphetamine use norms among homeless youth. *Soc Sci Res.* 2016;31(58):292–308.
 61. Dilorio C, Dudley WN, Soet J, Watkins J, Maibach E. A social cognitive-based model for condom use among college students. *Nurs Res.* 2000;49(4):208–14.
 62. Wingood GM, DiClemente RJ. Application of the theory of gender and power to examine HIV-related exposures, risk factors, and effective interventions for women. *Health Educ Behav.* 2000;27(5):539–65.
 63. Fethers K, Marks C, Mindel A, Estcourt CS. Sexually transmitted infections and risk behaviours in women who have sex with women. *Sex Transm Infect.* 2000;76(5):345–9.
 64. Stevens PE, Hall JM. Sexuality and safer sex: the issues for lesbians and bisexual women. *J Obstet Gynecol Neonatal Nurs.* 2001;30(4):439–47.
 65. Crepaz N, Marshall KJ, Aupont LW, Jacobs ED, Mizuno Y, Kay LS, Jones P, McCree DH, O'Leary A. The efficacy of HIV/STI behavioral interventions for African American females in the United States: a meta-analysis. *Am J Public Health.* 2009;99(11):2069–78.
 66. Sales JM, Lang DL, DiClemente RJ, Latham TP, Wingood GM, Hardin JW, Rose ES. The mediating role of partner communication frequency on condom use among African American adolescent females participating in an HIV prevention intervention. *Health Psychol.* 2012;31(1):63.
 67. Bauman KE, Fisher LA. On the measurement of friend behavior in research on friend influence and selection: findings from longitudinal studies of adolescent smoking and drinking. *J Youth Adolesc.* 1986;15(4):345–53.
 68. Arnold EM, Rotheram-Borus MJ. Comparisons of prevention programs for homeless youth. *Prev Sci.* 2009;10(1):76–86.