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ORIGINAL PAPER

Individual and Partnership Factors Associated with Heterosexual Anal Intercourse Among Attendees of Public Sexually Transmitted Disease Clinics in Los Angeles County

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Abstract

Heterosexual anal intercourse (HAI) is an understudied sexual behavior and poses unique challenges to the prevention of sexually transmitted diseases (STDs). This study aimed to explore individual and partnership characteristics associated with HAI. This study used data collected from 243 young people who attended STD clinics in Los Angeles County between April 2012 and May 2014. Participants reported on sexual behaviors with their last three sexual partners. Hierarchical, mixed effects, repeated-measures analyses were used to assess partner-level (demographic) and individual-level (demographic and behavioral) factors associated with recent (past 6 months) HAI. Thirty-two percent of participants ($n = 243$) reported HAI with at least one recent sex partner, and 49% reported ever having anal intercourse (AI). After adjusting for demographic characteristics, HAI was more than twice as likely to occur in relationships ($n = 503$) lasting more than a year compared to relationships lasting less than one month. HAI was also more likely to occur in relationships where intimate partner violence (IPV) was reported either as IPV initiated by the respondent (aOR = 2.18, 95% CI 1.08–4.41) or IPV initiated by the partner (aOR = 2.38, 95% CI 1.27–4.47). Among our participants, a substantial proportion reported HAI in the recent past 6 months and nearly half reported lifetime AI. Notably, our results indicate the importance of relationship contexts for people engaging in HAI and highlight the increased risk of STD/HIV transmission in the context of relationships with intimate partner violence victimization and perpetration.

Keywords Heterosexual anal intercourse · Sexual behavior · Intimate partner violence · Partner-level analysis

Introduction

Sexually transmitted diseases (STDs) present an important, preventable, and continuing public health problem due to the many immediate and long-term health issues associated with these infections (Centers for Disease Control and Prevention, 2018a). Certain risk behaviors and sexual activities can increase the risk of STDs in adolescents and young adults, particularly anal intercourse (AI). While national survey prevalence estimates of ever having heterosexual anal intercourse (HAI) for ages 15–44 have been 33% for women and 39% for men, some studies have reported prevalence estimates as high as 41% (Jenness et al., 2011; National Center for Health Statistics & Centers for Disease Control and Prevention, 2015). Studies targeting adolescents and young people have reported HAI prevalence estimates of 11% and 16% in various study populations (Leichliter, Chandra, Liddon, Fenton, & Aral, 2007; Lescano et al., 2009), and, in general, most studies indicate that condom use during HAI is uncommon (Houston, Fang, Husman, & Peralta, 2007; Leichliter et al., 2007). With populations reporting high proportions of HAI and perhaps under-reporting actual HAI, it is important to understand the increased sexual health "risks" associated with HAI and factors related to engaging HAI that can be used to screen during sexual health wellness appointments.

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Systematic reviews of the literature revealed that, when compared to vaginal intercourse (VI), HAI increased risk of male-to-female transmission of HIV-1 (Mastro & de Vincenzi, 1996) and found receptive HAI to be a higher-risk sexual activity for contracting HIV than receptive VI (Boily et al., 2009). While most research on HAI has focused on HIV transmission and prevention implications, some studies provide evidence of increased risk of other STDs (Javanbakht et al., 2010; Leichliter et al., 2007). In a study of women at high risk of STDs, those who reported unprotected VI had half the risk of having had an STD compared to women who had both unprotected VI and AI (AOR = 0.39; 95% CI = 0.23, 0.67) (Jenness et al., 2011). Additionally, a study investigating the prevalence of urogenital and anal chlamydia and gonorrhea infections found significant proportions of the study population presenting with anal-only chlamydia (25.4%) and gonorrhea (18.5%) infections (Javanbakht et al., 2012). These results suggest that anal-related infections would have been missed without consideration of HAI and rectal screening protocols for STDs within this context.

Limited research has investigated HAI as a sexual behavior, but it has suggested demographic characteristics such as age (Halpern & Haydon, 2012; Herbenick et al., 2010), gender (Herbenick et al., 2010), race/ethnicity (Benson, Martins, & Whitaker, 2015; Hess, Reynolds, & Fisher, 2014; Javanbakht et al., 2010), and socioeconomic status (Benson et al., 2015) are associated with having HAI. Additionally, sexual risk behaviors—transactional sex, drug/substance use, and sex under the influence of drugs/other substances (Gorbach et al., 2009; Hensel, Fortenberry, & Orr, 2010; Ibañez, Kurtz, Surratt, & Inciardi, 2010; Javanbakht et al., 2010; Jenness et al., 2011; Leichliter et al., 2007; Reynolds, Fisher, Napper, Fremming, & Jansen, 2010)—have been associated with an increased odds of engaging in HAI. In addition to individual-level factors, there are other factors, such as relationship contexts, that are important in understanding HAI as a sexual health behavior.

Since HAI may be particularly impacted by reporting biases, both in clinic and in research, an interesting line of research has investigated the relationship contexts of HAI perhaps de-stigmatizing anal sex for some respondents. HAI has been reported more frequently in main or primary relationships than in casual sex relationships (Carter, Henry-Moss, Hock-Long, Bergdall, & Andes, 2010; Houston et al., 2007). However, there are also studies that report HAI being associated with transactional sex and/or one-time sex partners (Gorbach et al., 2009; Javanbakht et al., 2010; Jenness et al., 2011). Adding a final layer of relationship context complexity, some studies have suggested that HAI occurs more often in relationships where intimate partner violence (IPV) is present (Decker et al., 2014; Hess et al., 2012). IPV can manifest as physical, sexual, or psychological violence that can have significant repercussions on health outcomes. Among a sample of women attending a public health clinic, 18% reported experiencing IPV in the past 3 months, 28% reported experiencing IPV in the past year, and 57% reported experiencing IPV in their lifetime (Mittal, Senn, & Carey, 2011, 2012). IPV has been associated with poorer sexual health outcomes (e.g., unplanned pregnancy, increased STDs), an increase in sexual "risk" behavior (e.g., condomless sex, sex under the influence, decrease use of hormonal contraception), and other poor mental and physical health outcomes (Bonomi, Anderson, Rivara, & Thompson, 2007; Coker, 2007; Li et al., 2014; Maxwell, Devries, Zionts, Alhusen, & Campbell, 2015; Mittal et al., 2011; Overstreet, Willie, Hellmuth, & Sullivan, 2015).

Given the potential for increased risk of STDs from any anal sex, understanding partnership-level factors and the context in which HAI occurs is critical in better informing STD/HIV prevention and testing strategies among a highly impacted group, namely young people. This study aims to describe individual- and partnership-level characteristics associated with HAI for young people ages 15–29 attending public STD clinics in Los Angeles County.

Method

Participants

This study used data that originally aimed to assess factors associated with pharyngeal gonorrhea among young people (Javanbakht, Westmoreland, & Gorbach, 2018). Prior approvals from the Institutional Review Board at the University of California, Los Angeles, and the Los Angeles County Department of Public Health were obtained before recruitment. Young men and women visiting public STD clinics in Los Angeles County between April 2012 and May 2014 were recruited for the study if they were: (1) aged 15–29 years, (2) reported sexual activity with a partner of the opposite sex in the past 90 days, and (3) attended one of 12 public STD clinics in Los Angeles County. Those who were eligible and interested in participating completed a computer-based, self-administered questionnaire on sexual risk behaviors and received STD screenings (urogenital and pharyngeal chlamydia and gonorrhea). Participants provided written informed consent and received $25 for their time.

Procedure and Measures

The study survey was administered using a web-based, computer-assisted self-interview and took approximately 45 min to complete. The questionnaire included information on: (1) demographic characteristics, (2) recent sexual partner

characteristics and partner-level sexual behaviors, and (3) general sexual risk behaviors, knowledge, and attitudes. This study leverages questions from the survey focusing on AI to further our understanding of this sexual behavior.

Heterosexual Anal Intercourse Recent HAI was the main outcome of interest for this analysis. Participants were asked to report their sexual behaviors with up to 3 of their most recent sexual partners (past 6 months). Specifically, we assessed any AI with and without a condom. Using this sexual behavior information and the reported gender of the partner, we created a bivariate yes/no variable representing whether or not participants had engaged in HAI with any of their recent partners. Respondents were asked to report the gender of their sex partner and whether or not they engaged in protected or unprotected AI which were used to create our measure of HAI.

Relationship and Partner Characteristics In addition to the sexual behaviors that participants were engaging in with their recent sexual partners, we also collected partner demographic characteristics (i.e., age, race/ethnicity, gender) and relationship characteristics (e.g., partnership type, length of partnership, and commitment to partner). For example, participants were asked, "how would you describe your relationship with [last partner]?" Participants could choose between main, casual, one-time, trade, or they could write in their own partner description. Each of these answer choices included a study-specific definition of the partnership type.

Intimate Partner Violence Within partnerships, we also investigated the association of IPV with HAI. Participants were asked two questions regarding being threatened with physical violence and the occurrence of physical violence developed specifically for this survey. First, participants were asked "[H]ow often has/did [Partner's Nickname] threaten you with violence, pushed or shoved you, or thrown something at you that could hurt?" Participants were also asked "[H]ow often has/did [Partner's Nickname] slap, hit or kick you?" and "[H]ow often have you had an injury, such as a sprain, bruise, or cut because of a fight with [Partner's Nickname]?" For both of these questions, respondents could choose a timeframe during which the IPV happened—never; this has not happened in the past 6 months, but it did happen before then; once in the last 6 months; twice in the last 6 months; three to five times in the last 6 months; six to 10 times in the last 6 months; 10 or more times in the last six months—later categorized as ever (in the past 6 months) or never/not in the last 6 months. Additionally, all three of these questions were asked in two directions: partners threatening and committing the violence, as well as respondents who threatened or physically abused their partners.

Other questions that were considered to assess potential emotional abuse/imbalance of partnership dynamics within the relationship were derived from the Sexual Relationship Power Scale developed by Pulerwitz, Gortmaker, and DeJong (2000). Examples of these individual items used include "If I asked my partner to use a condom, he/she would get angry." For these questions, participants were asked whether they strongly agreed, agreed, disagreed, or strongly disagreed. Participants were also asked questions to assess the power dynamics such as "Who usually has more say about when you talk about serious things?" Participants could select their partner, both equally, and themselves. These questions were assessed for their association with HAI, but, in our study sample, we found no statistically significant associations. Therefore, the results of this study focus on the questions assessing threats of and occurrence of physical violence described in the aforementioned paragraph.

Other Covariates Individual-level factors included in the analyses were socio-demographic factors—age, race/ethnicity, employment status—and sexual risk behaviors—transactional sex, drug/substance use, partner's incarceration status. Behavioral variables such as substance use, sex under the influence of drugs or alcohol, transactional sex, and partner's incarceration status were assessed for the past year—e.g., "In the past 12 months, how many times have you had sex with someone who has been to jail or prison?" Additionally, we report the prevalence of chlamydia and gonorrhea among study participants.

Statistical Analysis

Descriptive statistics were calculated for all continuous (medians, ranges) and categorical (frequencies and percentages) variables. Factors tested for inclusion in the multivariable models were based on bivariate analyses or based on the existing literature. Differences between groups were evaluated using t tests, chi-squared methods, and Fisher's exact test as appropriate. Multivariable, hierarchical, mixed effects, repeated-measures models were used to determine the associations of individual- and partnership-specific characteristics with engaging in HAI during the partnership. Due to collinearity between partnership characteristics and IPV variables, these associations were assessed in separate models. Adjusted odds ratios (AORs) and 95% confidence intervals (CIs) were reported for each test of association. All analyses were conducted using SAS version 9.4 (SAS Institute, 2014).

Results

Descriptive Overview of Study Participants

The largest proportions of our participants were between the ages of 20–24 (48%), female (57%), and identified as non-Hispanic Black/African-American (53%). Less than half of participants were employed (45%), and very few reported being homeless (7%). Most reported having opposite sex,

sex partners (89%). Almost half of our participants (49%, $n = 116$) reported ever having had AI, and 32% reported HAI in the past 6 months. The prevalence of chlamydia was 14%, and because of oversampling of gonorrhea cases from the original study, 27% had gonorrhea. There were no statistically significant differences between chlamydia ($p = .99$) and gonorrhea ($p = .48$) prevalence between those who engaged in HAI and those who did not. About half of our study participants reported having had sex with someone on the same day they met them and very few reported engaging in transactional sex in the past year (11%) (Table 1).

Description of Partnerships

There were 74 participants who reported on only one recent sexual partner, 54 who reported on two, and 107 reported on three sexual partners (from the past 6 months) for a total of 503 partner observations (Table 2). Within all of the partnerships listed, 18% were partnerships in which HAI occurred. Most of the partners were 20–29 years old (20–24: 39%; 25–29: 26%), and a little over half (53%) identified as Black/African-American. A little over half of the partnerships listed were causal or one-time sexual partners (53%), and over half of the partnerships (53%) were happening concurrently with other sexual relationships. Only a quarter of the partnerships lasted over a year. IPV was reported among 19% of these partnerships. Respondents reported initiating IPV in 12% of the partnerships, while 18% of partnerships had partner-initiated violence (Fig. 1).

Partnership Factors Associated with Heterosexual Anal Intercourse

After adjusting for repeated observations, the partnership characteristics associated with HAI in bivariate analyses were type of partnership ($p < .0001$), length of time with partner ($p = .0002$), commitment to partner ($p = .01$), and reported IPV (any, $p < .0001$; respondent initiated, $p = .02$; and partner initiated, $p = .0002$) (Table 2). Specifically, HAI was more common in longer relationships and reported in 27% of relationships that spanned one or more years as compared to 10% of relationships that were less than a month ($p < .01$). Likewise, HAI was more prevalent in main partnerships as compared to casual or one-time partnerships (30% vs. 14%, respectively; $p < .01$) as well as partnerships that were classified as highly "committed" partnerships (26% vs. 12% for non-committed partners; $p = .01$).

In the interest of brevity, we will focus on length of time with partner to characterize the partnership in the regression analyses that follow. Other characterizations of the partnerships were more subjective (type or "label" and commitment), and time with partner can represent both of these constructs (Sprecher, 1999) while providing a more concrete measure. Additionally, the results for length of time with partner were similar in magnitude and direction for partner type and commitment level (results not presented). In multivariable analyses (Table 3), after adjusting for the respondent's age, gender, and race/ethnicity as well as the reported partner's age and race/ethnicity we found that partnerships that lasted over a year were approximately 2.5 times as likely to have reported recent HAI (aOR = 2.5, 95% CI 1.15–5.47) as compared to partnerships that lasted less than one month. The relationship between IPV and HAI was also considered from a number of different perspectives. Any form of IPV including being threatened with violence, being slapped, hit, or kicked, or sustaining an injury as the result of a fight either as the victim or the perpetrator of the violence was associated with HAI. Specifically, we found that reports of any IPV were associated with a nearly threefold increase in the likelihood of HAI, when compared to partnerships where no IPV was reported (aOR = 2.71, 95% CI 1.44–5.11). Examining IPV more closely, we found that respondent-initiated IPV was associated with a 2.2-fold increase in the odds of HAI (aOR = 2.18, 95% CI 1.08–4.41) and respondent victimization (i.e., partner was the perpetrator) was associated with a 2.4-fold increase in HAI (aOR = 2.38, 95% CI 1.27–4.47).

Discussion

Nearly one-third (32.3%) of participants who received sexual health care from STD clinics in Los Angeles County reported recent HAI with their most recent sexual partners. This estimate is closer to lifetime estimates reported by other studies and national behavioral surveillance (Benson et al., 2015; Carter et al., 2010; CDC & NCHS, 2015; Gorbach et al., 2009). Other reports estimating "recent" HAI vary in measurement time period and in estimates ranging from a 10% prevalence of HAI in the past 3 months (Javanbakht et al., 2010) to 38% in the past 12 months (Jenness et al., 2011). Differences from previous studies may partly reflect sexual behavior differences in our study population but may also reflect our comprehensive approach of assessing HAI within the context of the three most recent sexual partnerships in the past 6 months. Additional findings from this study highlight the importance of partnership characteristics and dynamics as it relates to HAI.

Our finding that HAI was more prevalent in partnerships that were longer in duration, considered main partnerships, or considered committed partnerships suggests that HAI occurs in the context of more intimate and closely linked partnerships, rather than casual partnerships. In fact, previous research among women indicates that AI is typically reserved for those they know and trust, and view AI as a way to express intimacy (Reynolds, Fisher, & Rogala, 2015;

Table 1 Individual characteristics and associations with recent, partner-specific HAI, Los Angeles County, 2012–2014

Demographic characteristics	Freq.	(%)	Individuals reporting at least one partnership	
			$n = 235$	
			Prevalence of recent HAI	p value
Age				.91
15–19	52	(21.4)	33.3	
20–24	117	(48.2)	31.0	
25–29	74	(30.5)	33.8	
Gender				.47
Male	106	(43.6)	35.0	
Female	137	(56.4)	30.3	
Race/ethnicity				.01
African-American	128	(52.7)	22.1	
Other	21	(8.6)	50.0	
White	21	(8.6)	38.1	
Hispanic	73	(30.0)	43.1	
Gender of sex partners				1.00
Heterosex partners	217	(89.3)	32.2	
Some same-sex partners	26	(10.7)	33.3	
Work and student status				.54
Employed	108	(45.0)	35.2	
Student	46	(19.2)	26.7	
Unemployed, non-student	86	(35.8)	30.1	
Homeless				.78
No	227	(93.4)	32.7	
Yes	16	(6.6)	26.7	
Ever had anal intercourse				–
Yes	116	(49.0)	–	
No	120	(51.0)	–	
Reported recent HAI				–
Yes	76	(32.3)	–	
No	159	(67.7)	–	
Positive for gonorrhea				.48
No	169	(72.8)	31.1	
Yes	63	(27.2)	36.1	
Positive for chlamydia				.99
No	204	(85.7)	32.5	
Yes	34	(14.3)	32.4	
Risk behaviors				
Been in jail in past 12 months				.55
Yes	50	(22.9)	30.0	
No	168	(77.1)	34.5	
Alcoholic beverage consumption past year				.42
Never	40	(19.0)	25.0	
Once or twice a month	95	(45.0)	34.7	
Weekly	59	(28.0)	35.6	
Daily or almost daily	17	(8.1)	47.1	
Marijuana use in the past year				.84
Never	64	(31.4)	37.5	
Once or twice a month	47	(23.0)	29.8	

Table 1 (continued)

Demographic characteristics	Freq.	(%)	Individuals reporting at least one partnership	
			$n = 235$	
			Prevalence of recent HAI	p value
Weekly	32	(15.7)	37.5	
Daily or almost daily	61	(29.9)	34.4	
Used club drugs in the past year				.82
No	147	(82.6)	33.3	
Yes	31	(17.4)	35.5	
Used other drugs in the past year				.89
No	126	(80.3)	34.1	
Yes	31	(19.8)	35.5	
Sexual health behaviors				
Met a sex partner on the Internet				.54
Yes	70	(32.0)	35.7	
No	149	(68.0)	31.5	
Had sex with someone met on the same day				.63
Yes	109	(49.8)	34.9	
No	110	(50.2)	31.8	
Had any transactional sex in past 12 months				1.00
No	185	(84.5)	32.4	
Yes	34	(15.5)	35.3	
Had sex with someone who takes drugs in past 12 months				.74
Yes	10	(4.6)	40.0	
No/do not know	208	(95.4)	33.2	
Had sex with someone who had been to jail in the past 12 months				.14
No	170	(78.3)	31.2	
Yes	47	(21.7)	42.6	
Drank alcohol while having sex in the past year				.24
Yes	142	(67.9)	36.6	
No	67	(32.1)	28.4	
Used marijuana when having sex in the past year				.89
Yes	117	(57.1)	35.0	
No	88	(42.9)	34.1	
Used club drugs when having sex in the past year				.88
Yes	149	(84.2)	34.2	
No	28	(15.8)	35.7	
Used other drugs when having sex in the past year				.85
Yes	133	(82.6)	33.8	
No	28	(17.4)	35.7	

Stahlman et al., 2015). This could have particular implications for condom use which may not be preferred in longer lasting, or committed, partnerships (Manlove et al., 2011) or for pre-exposure prophylaxis (PrEP) for which many women may not readily appear to be candidates (Calabrese et al., 2019). Indeed, women in longer-lasting relationships seem to prefer hormonal contraception or long-lasting contraceptive methods as opposed to condoms use (Bolton, McKay, & Schneider, 2010; Upadhyay, Raifman, & Raine-Bennett, 2016; Whitaker, Dude, Neustadt, & Gilliam, 2010). Further, women who engage in AI would benefit from PrEP especially if they meet other PrEP eligibility criteria (Centers for Disease Control and Prevention, 2018b) including experiencing IPV (Marshall, Fowler, Walters, & Doreson, 2018). Therefore, for people in longer relationships who may also have varying partner sexual agreements (e.g., open relationships or consensual non-monogamy) would benefit from

Table 2 Descriptive statistics of individual- and partner-level factors for all reported partnerships, Los Angeles County, 2012–2014

Demographic characteristics	Frequency	(%)	Partnerships	
			$n=503$	
			Prevalence of HAI	p value
Number of partners				
1 partner	74	(14.7)		
2 partners	108	(21.5)		
3 partners	321	(63.8)		
Age of partners	503			.35
15–19	71	(15.1)	12.7	
20–24	182	(38.8)	18.1	
25–29	122	(26.0)	18.0	
35 +	94	(20.0)	23.4	
Gender of partners				.29
Male	252	(50.1)	19.8	
Female	251	(49.9)	15.9	
Race of partners				.03
African-American	254	(52.5)	13.0	
Hispanic	47	(9.7)	21.3	
White	62	(12.8)	14.5	
Other	121	(25.0)	27.3	
Any recent anal				–
No	402	(79.9)	–	
Yes	101	(20.1)	–	
Recent HAI				–
No	413	(82.1)	–	
Yes	90	(17.9)	–	
Concurrent partnerships while with any partner (respondent initiated)				.118
None	232	(47.2)	20.0	
One other person	136	(27.6)	35.6	
A few other ppl	103	(20.9)	50.0	
Lots of other ppl	21	(4.3)	28.6	
Relationship characteristics				
Type of partnership				< .0001
Main	215	(42.7)	29.8	
Casual or one-time partner	266	(52.9)	8.7	
Other	22	(4.4)	13.6	
Length of time with partner				.0002
Less than one month	182	(36.6)	9.9	
One month to a year	191	(38.4)	19.4	
More than one year	124	(25.0)	27.4	
Commitment to partner				.01
Completely/very committed	202	(50.0)	25.7	
Somewhat committed	93	(23.0)	15.1	
Not at all committed	109	(27.0)	11.9	
Any IPV				< .0001
Never/not in the last 6 months	322	(80.7)	15.8	
Ever in the last 6 months	77	(19.3)	40.3	
Respondent-initiated IPV				.02
Never/not in the last 6 months	352	(87.6)	18.2	
Ever in the last 6 months	50	(12.4)	36.0	

Table 2 (continued)

Demographic characteristics	Frequency	(%)	Partnerships	
			$n = 503$	
			Prevalence of HAI	p value
Main partner-initiated IPV				.0002
Never/not in the last 6 months	334	(82.1)	16.2	
Ever in the last 6 months	73	(17.9)	39.7	
Reciprocal threats of physical violence				.06
Never/not in the last 6 months	337	(90.6)	15.7	
Ever in the last 6 months	35	(9.4)	31.4	
Reciprocal physical violence (slap, hit)				.16
Never/not in the last 6 months	355	(93.2)	17.8	
Ever in the last 6 months	26	(6.8)	30.8	
Reciprocal injuries				.37
Never/not in the last 6 months	371	(96.6)	18.9	
Ever in the last 6 months	13	(3.4)	30.8	

multi-anatomical site STD screening especially given that they may be engaging in multiple types of sex.

Our results are consistent with previous investigations of HAI and IPV but add to the literature by focusing on recent partnerships and HAI. In our study, participants who reported any IPV were more likely to also report having HAI in those relationships. Specifically, participants who were threatened with violence by their partners and participants who threatened their partners with violence were more likely to have engaged in HAI. Previous studies have found AI to be more likely reported in relationships with physical or sexual violence (Hess et al., 2013), and that women with a recent history of IPV were more likely report unprotected AI (Decker et al., 2014). One interesting finding in the literature suggests that HAI was more likely to occur in relationships where violence was reciprocal (Hess et al., 2013). While not explicitly investigated in this study for reciprocal IPV, our results do suggest that HAI is associated with being threatened with violence despite who instigates the threats. Further, our study did not find associations of emotional/psychological IPV with engaging in HAI. However, these are important forms of IPV that should continue to be evaluated as previous literature has indicated that non-physical forms of IPV and lack of agency within a relationship—that is, lacking power with a relationship—also negatively influence engaging in sexual "risk" behavior and sexual health within partnerships (Harvey, Bird, Galavotti, Duncan, & Greenberg, 2002; Overstreet et al., 2015).

Motivations for IPV vary by gender but generally include power and control, retaliation for wrong doing, and self-defense. As a result, Hess et al. (2013) suggested that one possible link between IPV and HAI was violence through an undesirable sex act. This could be due in part to retaliation for other sexual behaviors, such as partner concurrency, that

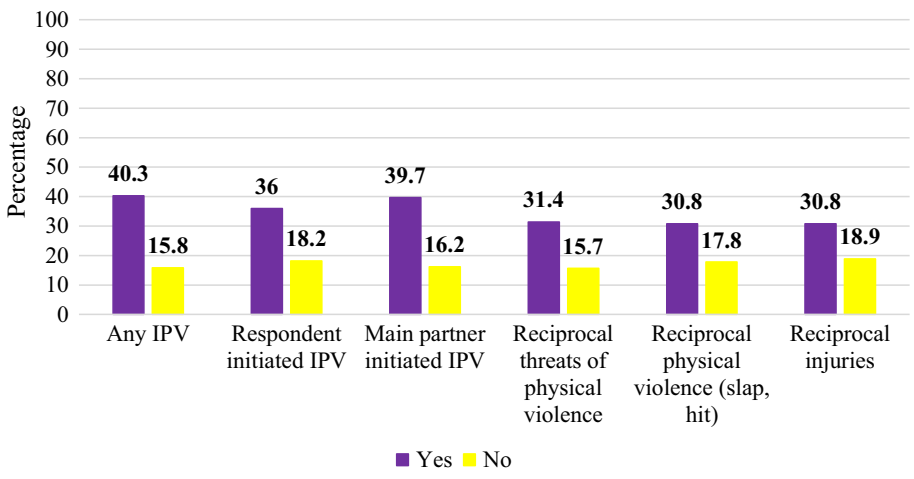

Fig. 1 Prevalence of heterosexual anal intercourse by type of intimate partner violence in recently reported partnerships, Los Angeles County, 2012–2014 ($n = 508$)

Table 3 Multivariable models assessing the relationship of individual- and partner-level factors with recent heterosexual anal intercourse, Los Angeles County, 2012–2014

	Model 1				Model 2				Model 3				Model 4				Model 5			
	Demographics only				Demographics + Time with partner				Demographics + Time with partner + Any IPV				Demographics + Time with partner + Respondent-initiated IPV				Demographics + Time with partner + Partner-initiated IPV			
	95% CI				95% CI				95% CI				95% CI				95% CI			
	aOR	LL	UL	*p* value	aOR	LL	UL	*p* value	aOR	LL	UL	*p* value	aOR	LL	UL	*p* value	aOR	LL	UL	*p* value
Age																				
15–19																				
20–24	0.65	0.28	1.51	.32	0.59	0.24	1.43	.24	0.52	0.20	1.33	.17	0.53	0.22	1.28	.16	0.51	0.20	1.31	.16
25–29	0.78	0.32	1.91	.58	0.68	0.27	1.75	.43	0.66	0.25	1.78	.42	0.61	0.24	1.56	.30	0.65	0.24	1.73	.39
Gender																				
Male																				
Female	2.17	1.21	3.91	.01	2.34	1.00	5.46	.05	1.68	0.84	3.35	.14	1.67	0.85	3.25	.13	1.68	0.85	3.31	.13
Race																				
African-American	0.44	0.16	1.24	.12	0.44	0.15	1.25	.12	0.45	0.14	1.41	.17	0.51	0.17	1.59	.25	0.45	0.15	1.39	.17
Other	1.31	0.42	4.08	.64	1.31	0.40	4.23	.66	0.95	0.28	3.27	.94	1.11	0.33	3.72	.86	1.00	0.29	3.42	1.00
White																				
Hispanic	1.47	0.54	4.02	.45	1.48	0.52	4.15	.46	1.48	0.49	4.48	.48	1.69	0.57	4.98	.34	1.50	0.50	4.51	.47
Age of partners																				
15–19																				
20–24	1.36	0.57	3.21	.49	1.29	0.55	3.03	.56	1.36	0.51	3.61	.53	1.41	0.55	3.66	.48	1.35	0.51	3.58	.54
25–29	1.74	0.67	4.50	.25	1.69	0.64	4.47	.29	1.35	0.46	3.97	.58	1.52	0.53	4.42	.44	1.40	0.48	4.10	.54
35 +	1.93	0.72	5.12	.19	2.28	0.87	5.98	.09	2.01	0.66	6.15	.22	2.23	0.75	6.58	.15	2.09	0.68	6.39	.20
Race of partners																				
African-American	1.25	0.47	3.31	.65	1.18	0.46	3.06	.73	0.94	0.34	2.60	.90	0.97	0.35	2.73	.96	0.98	0.36	2.70	.97
Hispanic	2.70	1.00	7.23	.05	2.62	0.99	6.93	.05	1.70	0.61	4.74	.31	2.00	0.71	5.63	.19	1.78	0.66	4.82	.25
White																				
Other	1.79	0.55	5.83	.34	1.97	0.63	6.11	.24	1.46	0.45	4.70	.52	1.65	0.51	5.34	.40	1.59	0.50	5.04	.43
Length of time with partner																				
Less than one month																				
One month to a year					2.41	1.38	4.21	.002	1.76	0.90	3.45	.10	1.87	0.97	3.61	.06	1.74	0.89	3.38	.10
More than one year					3.81	1.85	7.86	.0003	2.51	1.15	5.47	.02	2.66	1.23	5.73	.01	2.53	1.16	5.50	.02
Any IPV																				
Never																				
Ever									2.71	1.44	5.11	.002								

Table 3 (continued)

	Model 1			Model 2			Model 3			Model 4			Model 5		
	Demographics only			Demographics + Time with partner			Demographics + Time with partner + Any IPV			Demographics + Time with partner + Respondent-initiated IPV			Demographics + Time with partner + Partner-initiated IPV		
	95% CI			95% CI			95% CI			95% CI			95% CI		
	aOR	LL	UL	aOR	LL	UL	*p* value	aOR	LL	UL	*p* value	aOR	LL	UL	*p* value
Respondent-initiated IPV															
Never															
Ever										2.18	1.08	4.41	.03		
Partner-initiated IPV															
Never															
Ever													2.38	1.27	4.47	.01

have also been associated with both IPV and HAI (Hess et al., 2013). However, in our study, we did not find a direct association between HAI and partner concurrency. We found that 29% of main partnerships—that represented just over half (51.6%) of all recorded partnerships—included IPV. Among these main partnerships, IPV was positively associated with the respondent engaging in sex with other sexual partners. Although our study is unable to confirm that a direct link between partner concurrency and HAI, we posit that, in the presence of IPV, there is a complex power and relationship dynamic that includes all three factors—HAI, IPV, and partner concurrency. Our study findings, in combination with other previous literature, highlight that there are complex decision-making mechanisms that are at play when people decide to engage in HAI. For some in relationships, engaging in HAI may be an expression of intimacy and commitment (Reynolds et al., 2015; Stahlman et al., 2015), but for others it may be tied to IPV (Hess et al., 2013). These findings provide insight regarding STI/HIV risk and vulnerability among those who engage in HAI. They also highlight that different approaches to STI/HIV prevention would be needed for these very different contexts including violence prevention strategies targeted to both perpetrators and victims have the potential to also improve sexual health outcomes.

Our findings should be interpreted in consideration of some of the limitations of this study. Data collected on behaviors and sexual behaviors of interest were collected based on self-report. Although this information was collected using self-administered interviews, data on socially stigmatized or illicit activities may suffer from reliability and validity issues resulting in response bias and potential underestimation of these behaviors (Catania, Gibson, Chitwood, & Coates, 1990; Fendrich, Johnson, Sudman, Wislar, & Spiehler, 1999; Newman et al., 2002). Furthermore, these participants were recruited from patients attending public STD clinics and may not be representative—in the types of behaviors they engage in and the characteristics of their relationships—of all young people attending sexual health clinics or receiving sexual health care with their private physicians. Finally, point estimates from some analyses should be interpreted with caution due to small sample sizes, although their general direction of associations can be used to inform future studies with larger sample to obtain more precise estimate. Despite these limitations this study contributes to the limited literature on HAI among young people and offers a relationship specific view of HAI, IPV, and STD risk/vulnerability.

Conclusions

These results help to highlight that HAI is a complex sexual health behavior that requires special considerations when creating and designing sexual health education and prevention messaging. Despite known sexual health risks of AI, safe AI messaging continues to be under-represented in sexual health prevention messaging and education. Based on our

study results, messages seeking to increase healthy HAI behaviors should incorporate individual characteristics and consider relationship contexts.

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Compliance with Ethical Standards

Conflict of interest The authors declare no conflict of interest.

Informed consent Participants provided written informed consent prior to enrollment. The study was approved by the Institutional Review Board at the University of California Los Angeles and the Los Angeles County Department of Public Health.

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