

# Barebacking among MSM Internet Users

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**Abstract** This theory-driven study explored the phenomenon *barebacking* among Men who have Sex with Men (MSM) Internet users. Two hundred and forty men were recruited online and asked to complete a web-based survey. Forty percent of men in this geographically diverse sample reported engaging in bareback sex. Consistent with other research, findings demonstrate that compared with non-barebackers, men who engage in bareback sex are more likely to use alcohol in sexual contexts, use the Internet to meet sex partners, engage in any unsafe sex, and report higher degree of sexual sensation seeking. They are also more likely to report lower perception of safer sex social norms and lower self-efficacy for limiting HIV risk. Lack of concept discrimination between unprotected anal intercourse and barebacking suggests barebacking is a neologism that serves as a manifestation of the changing nature of sexual risk taking among some MSM. Opportunities for reducing the rate of HIV transmission among MSM are suggested.

**Keywords** Barebacking · Internet · MSM · HIV · AIDS · Sexual behavior · Risk factors

## Introduction

Recent reports (Bimbi and Parsons 2005; Halkitis and Parsons 2003; Halkitis et al. 2003; Halkitis et al. 2005a, b; Mansergh et al. 2002) suggest that some MSM have abandoned safer sexual practices in favor of actively

seeking out men for purposeful unprotected anal intercourse (UAI), an HIV risk behavior generally referred to as *barebacking*. The purpose of this study was twofold: To provide an indicator of the extent of bareback sex among MSM Internet users and to identify behavioral and psychosocial factors associated with barebacking.

The term ‘barebacking’ emerged within the gay community in the mid-1990s, and early research suggested that gay men understood it as intentional, unprotected anal sex (Halkitis and Parsons 2003; Halkitis et al. 2003). According to one informant, ‘It means someone who has unprotected sex intentionally. The intention defines a barebacker’ (Carballo-Diéguez 2001, p. 229). Thus, while the sexual behavior is the same on a physical level, in the academic literature bareback sex has been differentiated from UAI on the basis of intentionality. Some have suggested barebacking may also represent a different type of sexual experience than other sexual risk behaviors (Halkitis et al. 2005a). Although researchers have been relatively consistent in their use of the term barebacking, referring to it as intentional or premeditated unprotected anal sex with casual partners, typically in HIV risk contexts (Goodroad et al. 2000; Halkitis et al. 2003; Mansergh et al. 2002; Suarez and Miller 2001; Yep et al. 2002), the meaning of the term barebacking has changed over time. While in the past it seemed researchers and barebackers were in agreement regarding the difference in internal agency between UAI and bareback sex, this distinction has become nebulous more recently as MSM increasingly define barebacking simply as condomless anal sex (Halkitis et al. 2005a; Huebner et al. 2006; Wilton et al. 2005).

Barebacking among MSM is of public health interest because it can lead to sexually transmitted infections (STIs), HIV transmission among serodiscordant partners,

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and reinfection among HIV-positive (HIV+) partners—Possibly with a more potent or virulent strain of the virus (Chin-Hong et al. 2005; Elford 2006; Wheeler et al. 2003). Rates of STIs such as syphilis have increased among MSM in recent years (Douglas et al. 2005; Montoya et al. 2005) and from 2003 to 2004 the rate of new HIV infections among this population increased by 8.0% (CDC 2006). Moreover, the topic barebacking also warrants additional research because risk factors for barebacking are understudied. Despite receiving widespread attention in the mainstream and gay media (e.g., Chibbaro Jr 2006; Gendin 1999; Kirby 1999; Lynsen 2006; Peyser and Roberts 1999; Sheon and Plant 1997; Signorile 1999; Sowadsky 1999), as the topic of scientific inquiry, barebacking is a nascent research area in general. Furthermore, as pointed out by Parsons and Bimbi (2007), there is an absence of theory-based studies in particular. This is a serious void because a sound theoretical base is necessary to develop more useful conceptual frameworks and reference points to guide interventions by educators and prevention professionals.

As a result of having scant research, the extent of this HIV risk behavior, sociodemographic characteristics of MSM engaging in bareback sex, and risk factors associated with barebacking are largely unknown. Few researchers have attempted to estimate prevalence of barebacking among their study samples, and those who have, report divergent results. Self-report measures indicate that between 10.0% (Mansergh et al. 2002) and 83.9% (Halkitis and Parsons 2003) of MSM in these samples engaged in bareback sex. Although finding exact prevalence rates is impossible, further studies can help indicate the degree to which this behavior is becoming a pervasive public health problem throughout US.

There is some evidence that the majority of men who engage in bareback sex are seropositive and may live in urban epicenters with large segments of gay and bisexual persons (Halkitis et al. 2003; Halkitis et al. 2005a; Mansergh et al. 2002). Although a large minority of HIV-negative (HIV-) men also report bareback sex, HIV+ men are more likely to engage in barebacking than seronegative men. HIV+ men are also more likely than HIV- men to engage in bareback sex with seroconcordant men or men of unknown HIV-status (Bimbi and Parsons 2005; Elford et al. 2007; Halkitis and Parsons 2003; Halkitis et al. 2003; Halkitis et al. 2005a; Mansergh et al. 2002; Wilton et al. 2005). When researchers measured barebacking as an identity construct rather than a behavioral construct, they found that seropositive MSM who were White, younger (Halkitis et al. 2005b), used crystal methamphetamine and cocaine with sex, and expressed higher peer norms for

unprotected sex (Parsons and Bimbi 2007) were more likely to self-identify as a barebacker.

Several studies have shown that, compared with non-barebackers, men reporting bareback sex exhibit a number of increased risk behaviors, including: Self-reported higher prevalence of any unprotected sex with men of unknown or serodiscordant HIV-status, more frequent use of crystal methamphetamine in the previous 3 months (Mansergh et al. 2002), and more likely use of club drugs (Halkitis et al. 2003). They also report lower levels of perceived responsibility for safer sex and higher scores for sexual compulsivity (Halkitis et al. 2005b). Barebackers view bareback sex as an expression of masculinity (Halkitis and Parsons 2003; Halkitis et al. 2004) and sexual ‘adventurism’ (Carballo-Diéguez 2001; Halkitis and Parsons 2003; Halkitis et al. 2004; Mansergh et al. 2002) and generally report low perceptions of the seriousness of HIV: The likelihood of surviving HIV seems to be high,’ one man reasoned (Carballo-Diéguez 2001, p. 232). Due to advances in AIDS medication and treatments, they were not fearful of contracting HIV (Carballo-Diéguez 2001; Carballo-Diéguez and Bauermeister 2004; Halkitis et al. 2003; Suarez and Miller 2001). In fact, self-professed barebackers expressed a sense of fatalism about HIV (Carballo-Diéguez 2001) in their acceptance of the likelihood of infection. Nonetheless, sexual pleasure appears to be the most frequently cited reason for engaging in barebacking (Carballo-Diéguez and Bauermeister 2004; Mansergh et al. 2002).

The research literature points to an emerging cultural condition in which bareback sex is increasing in popularity in some MSM communities, such as MSM Internet users. Preliminary results offered by Halkitis and Parsons (2003) indicate that the Internet facilitates bareback sex by providing easy access to meeting other barebackers in US. Also in England, barebacking was found to be more common among an Internet sample compared to a sample from an HIV outpatient clinic (Elford et al. 2007). Grov (2006) estimates that there are about half a dozen US-based, large-scale websites exclusively catering to men seeking bareback partners, some with almost 30,000 members. Research shows that seeking men online for offline real-life sexual encounters is commonplace among MSM. One survey revealed that 97% of MSM had met a sexual partner via the Internet (Benotsch et al. 2002; Bull et al. 2001). As a result, compared with MSM who do not seek partners via the Internet, those who do so have more STIs, more partners, more UAI, and are less likely to test for HIV but more likely to have sex with a seropositive partner (Benotsch et al. 2002; Elford et al. 2001; McFarlane et al. 2000).

## Methods

This exploratory study had a cross-sectional design. All data were collected between February 2006 and May 2006, and all procedures were approved by the institutional review board at the researcher's university. The sample consisted of English speaking men who self-identified as MSM, lived in US, were 18 years or older, and used the Internet to meet other MSM. This population was selected because many of these men are at risk for HIV (re)infection and possibly engage in barebacking.

### Participants and procedures

The medium for recruitment and data collection was the Internet. Participants were recruited from websites devoted to male gay and bisexual content. The sites were identified through various US search engines via a series of search words: *m4m*, *bisexual*, *gay*, *men for men*, *queer*, *homosexual*, and *MSM*. Five personal advertisement sites catering to MSM and five generic sites designed to provide information, support, and contacts for MSM were selected. The ten websites selected for recruitment were chosen because of having a large membership volume, being US-based, and serving residents across US. Over a period of 11 weeks, the researcher actively recruited from the personal advertisement websites via email invitations and the generic websites via study invitation postings. In all, 6,520 recruitment emails were sent to men who had posted a personal advertisement. The researcher placed a bi-weekly electronic posting about the survey, including the URL to access the study site on the message/bulletin boards of each of the generic gay/bisexual oriented websites. After receiving the study invitation, individuals who chose to respond could either click on the survey URL or alternatively copy and paste it in the address box of their Internet browser. The URL took them to the study site.

The study website introduced the researcher, explained the purpose of the study and the voluntary nature of participation, included a consent form, and provided a link directing potential participants to the instrument page. The researcher, in collaboration with a university-based website design vendor, developed a simple and user-friendly instrument format designed to maximize validity and reliability of web-based survey results (Daley et al. 2003; Dillman 2000). The survey website was pilot-tested for functionality, readability, and appeal of images across different computer platforms/operating systems (Windows and Macintosh) and with different web-browsers (Internet Explorer, Mozilla Firefox, Opera, and Netscape). After this initial pretest process, the researcher invited members of a local lesbian, gay, bisexual, transgender, and queer support group to assess the survey appearance and readability. As a

result of the men's responses, minor changes on the survey were required. The above design and test steps adhered to the majority of the survey design quality criteria recommended by Andrews et al. (2003).

The website described the study and provided a consent statement. After respondents confirmed consent by clicking the 'I agree' box, they were taken to the online survey. The survey instructed the men to answer the questions as fully and honestly as possible, in a private location, without assistance from anyone. The participants were asked not to complete the survey again if they had completed it before. After completing and submitting the survey, respondents were automatically directed to the researcher's university website. In addition to confirming that the survey was a legitimate project conducted by a university researcher, this feature verified that the survey was successfully returned, thereby decreasing the likelihood of respondents re-sending the survey.

Since it is difficult to deliver a study incentive online without asking the participants to reveal their identity, the participants instead received an indirect incentive. The survey invitations and description explained that the researcher would personally donate money to the *Rainbow World Fund* (see Rainbow World Fund, n.d.) for each completed survey. Lack of direct recompense is not believed to be a barrier to participation, because the majority of Internet-based research has been conducted without offering participants incentives (Mustanski 2001).

### Measures

The survey included seven sections, each focusing on a separate area of research.

#### *Sociodemographics*

Respondents were asked to provide their age, race/ethnicity, US state of residence, size of town/city where they live, sexual orientation, relationship status, HIV-status, and education. No individual identifiable information was requested.

#### *Sexual behaviors*

Participants were asked to fill in the number of times they had engaged in various sexual behaviors and the total number of their different sexual partners within the previous 2 months. A 2-month time frame was selected for all behavioral questions because recall for this length of time is reported to be reliable (Kauth et al. 1991). Next to the questions referring to barebacking, the term was defined as 'intentional anal sex without a condom with a non-primary male partner.'

*Use of alcohol and drugs in context of sexual activity*

Three questions asked about the frequency of substance use (being drunk on alcohol, being high on crystal methamphetamine, and being high on other drugs) in anticipation of or during sex over the previous 2 months.

*Sexual sensation seeking*

A person's propensity to prefer exciting sexual stimulation was measured with the Sexual Sensation Seeking Scale (SSSS) (Kalichman et al. 1994). The nine items are summed (range 9–36) such that a higher score indicates higher propensity for sexual sensation seeking. In a previous study of gay men, Cronbach's  $\alpha = 0.75$  (Kalichman et al. 1994).

*AIDS health beliefs*

The Health Belief Model is one of the most widely used theories for explaining health behaviors and has been used to develop several scales as well as subscales to explain HIV risk behaviors. Zagumny and Brady's (1998) 16-item AIDS Health Belief Scale (AHBS) used in this study has four subscales that correspond to the components of the Health Belief Model: Perceived seriousness of HIV, perceived susceptibility to contracting HIV, perceived benefits of prevention methods, and perceived barriers to engage in HIV prevention behaviors. The subscale items were summed to yield a belief score (range 4–24). Higher scores indicated a greater amount of that belief, which theoretically is associated with lower HIV risk (for consistency, Barrier items were reversed so that higher score would indicate low perception of barriers). Recent assessments of the psychometric qualities of the AHBS have resulted in mixed findings. Zagumny and Brady reported high level of internal consistency (Cronbach's  $\alpha = 0.82$ ) for the total scale. Scandell and Wlazelek (2002), on the other hand, reported consistently lower levels of inter-item homogeneity, ranging from  $\alpha 0.58$  for the Benefits subscale to  $\alpha 0.69$  for Susceptibility. Additionally, while discriminant and convergent validity scores provided support for the scale, the measure did not predict high-risk sexual behavior. However, the above studies were administered to college student samples, who reported low levels of high-risk sexual behavior. Prior to the current study, no health belief scale for HIV risk behavior had been tested on an exclusively MSM population. Thus, the AHBS was deemed to be the best measure to assess HIV health belief constructs among MSM.

*Self-efficacy for limiting HIV risk behavior*

The 9-item Limiting HIV Risk Behaviors (LHRB) scale (Smith et al. 1996) was summed to yield a self-efficacy

score (range 9–36, Cronbach's  $\alpha = 0.77$ ). A higher score indicates higher self-efficacy for LHRB.

*Safer sex social norm perception*

The Safer Sex Social Norm Perception scale (SSSNP) used in the nationwide Young Men's Health Survey (Lemp et al. 1994) measures the degree to which respondents perceive that MSM in their social network endorse and engage in risky sexual behaviors, indicating a social norm for unsafe sex. The items are summed to yield a perception score (range 6–36). One of the six Likert-scaled questions was reversely presented to control for acquiescence response set. A higher score indicates perception of safer sex as a stronger social norm. In previous research, the scale yielded a Cronbach's  $\alpha$  of  $\alpha 0.84$  with gay men (Lemp et al. 1994).

Respondents were also asked how they learned about the study. The study included a total of 60 questions and took about 12 min to complete. An open response question format was used for the variables age, alcohol and drug use, and sexual behaviors because research indicates that this format provides increased reliability over closed response questions (Catania et al. 1990; Kalichman et al. 1997a; Kauth et al. 1991).

*Data analysis*

Pearson's biserial correlation was used to assess the relationship between the grouping variable (predictor), barebackers and non-barebackers, and the 12 criterion variables: UAI, meeting men online for offline sex, being drunk on alcohol in anticipation of/during sex, being high on crystal methamphetamine in anticipation of/during sex, and being high on other drugs in anticipation of/during sex, sexual sensation seeking, perceived seriousness of HIV, perceived susceptibility of HIV, perceived benefits of prevention methods, perceived barriers to engage in HIV prevention behaviors, self-efficacy for LHRB, and safer sex social norm perception. Chi-square tests were employed for the categorical sociodemographic questions. To provide an index of the degree of relationship between the predictor and the criterion variables and the proportion of variance in the grouping variable that was shared with each of the criterion variables, the correlation coefficient ( $r_{pb}$ ) and adjusted coefficient of multiple determination ( $_{adj}R^2$ ) were obtained.

**Results**

After 11 weeks of participant recruitment, 322 Internet users had visited the study website. Twenty-two visitors exited the site after reading the study description, and 43

participants left the survey questions before completion. Thus, the attrition rate was 13.3%. Further data cleaning removed 17 deficient survey submissions, including one data duplicate, leaving a final dataset of 240 participants. Because participants were recruited passively through postings on five generic gay/bisexual websites, the overall response rate could not be ascertained. However, given that all men received the email inviting participation and accurately reported that they learned about the study via such an invitation, the response rate for active online recruitment was 1.6%. This response rate, however, is likely deflated because it is based on two assumptions: That all individuals who were sent a personal survey invitation ( $n = 6,520$ ) in fact received it and that they met the inclusion criteria. Realistically, a great number of personals were probably 'dormant,' and although only US-based websites that in their description stated that they catered to adult men were selected for recruitment, many may not have met the inclusion criteria, including men under the age of 18, men who had not had sex with other men, and women. In fact, several men contacted the researcher via email to offer support for the study but explained their ineligibility because they were underage (under 18 years of age) or that they had not yet had sex with a man.

Levene's test for equality of variances was used to test equality of population variances on the 12 criterion variables. The results indicated that the population variances differed on three variables: (1) UAI,  $F(1, 238) = 32.58$ ,  $p < 0.001$ ; (2) meeting men online for offline sex,  $F(1, 238) = 9.47$ ,  $p < 0.01$ ; and (3) being high on other drugs in anticipation of/during sex,  $F(1, 238) = 8.45$ ,  $p < 0.01$ . Upon screening the data for non-normality, it was clear that these variables, plus the three variables being drunk on alcohol, being high on crystal methamphetamines, and perceived benefits of HIV prevention methods showed evidence of skewness and/or kurtosis (value above 2.0). Mahalanobis distance, provided in the DeCarlo Macro (DeCarlo 2006), identified the thirteen significant outliers in the dataset. To adequately meet data assumption criteria, these outlier cases were excluded from the analyses involving the respective variables. Thus, six analyses were conducted with  $n = 227$ . Inspection of stem and leaf plots with groups indicated and descriptive statistics supported no other variables were skewed or kurtotic.

Reliability analysis showed that all scales, except the AHBS, evidenced solid internal reliability in this sample. Cronbach's  $\alpha$  was highest for the SSSNP scale,  $\alpha 0.83$ . Levels of internal consistency for the SSSS and the LHRB scale, with nine items each, were  $\alpha 0.74$ . These reliability coefficients mirrored results from previous studies. Inter-item homogeneity for the AHBS subscales on the other hand, ranged from  $\alpha 0.36$  to  $\alpha 0.74$ , with full scale  $\alpha 0.54$ , which was lower than reliability scores reported in

previous studies. Reliability coefficients below  $\alpha 0.70$  are generally deemed inadequate and the reliability of a scale therefore uncertain (Kline 2005).

#### Description of the sample and extent of barebacking

Sociodemographic data are presented in Table 1. The mean age of the sample was 45.5 years. Most of the men were well educated, with 88.8% stating that they had at least some college education. However, men who reported bareback sex reported significantly lower educational attainment compared with men who did not report engaging in bareback sex ( $\chi^2 [4] = 10.18$ ,  $p < 0.05$ ). Geographically, the sample was evenly distributed throughout US, with about a quarter from each of the four US regions. With the exception of Kentucky, North Dakota, Oklahoma, and Utah, all states were represented. California had the highest number of participants (6.2%), followed by New York (4.9%), and Indiana (4.5%). About a quarter of the men (24.7%) were from a large city (between 10,001 and 1 million inhabitants), while 11.7% were from towns with fewer than 5,000 people. An overwhelming majority of the men described themselves as Caucasian (87.0%) and/or HIV- (87.0%). A somewhat higher percentage of barebackers, compared with non-barebackers, responded that they were HIV+ (7.4% vs. 4.1%) or unsure of their status (10.6% vs. 5.5%), but the difference was not significant. Almost all men described themselves as gay/homosexual (61.9%) or bisexual (35.1%).

Among the 240 study participants, 39.2% ( $n = 94$ ) reported engaging in bareback sex (Table 2). While most of the men (83.0%) were sexually active, only about half of the men (51.7%) stated they had engaged in protected sex one or more times in the past 2 months (mean 3.01). Almost two-thirds of the sample (63.8%) had found a sex partner online in the past 2 months (mean 2.61), but only a small number of men ( $n = 8$ ) had attended a bareback party. Of those who reported engaging in bareback sex, the majority (77.6%) reported doing so with a seroconcordant partner. Eighty men reported substance use in anticipation of or during sex in the past 2 months. Alcohol was the most frequently used substance, used by 19.6% of the participants, and only a small minority of the men reported being high on crystal methamphetamine or other illegal drugs in anticipation of or during sex, 4.2 and 9.6%, respectively.

#### Factors associated with bareback sex

Pearson's point-biserial correlation was used to assess statistically significant relationships between the grouping variable (MSM who bareback and MSM who do not) and 12 continuous variables. The results of its application are presented in Table 3. Barebackers and non-barebackers

**Table 1** Characteristics of the sample

Sociodemographic characteristics	Barebackers ( <i>n</i> = 94)		Non-barebackers ( <i>n</i> = 146)		Full sample ( <i>n</i> = 240)	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Age	43.44 (SD 12.32)		46.66 (SD 12.29)		45.50 (SD 12.38)	
<i>Education</i>						
High school degree or lower	13	13.8	9	6.2	22	9.2
Trade/vocational school	0	0	5	3.4	5	2.1
Some college	30	31.9	39	26.7	69	28.8
College graduate	32	34	47	32.2	79	32.9
Graduate degree	19	20.2	46	31.5	65	27.1
<i>US region of residence</i>						
West	28	29.8	38	26.2	66	27.6
Midwest	23	24.5	35	24.1	58	24.3
Northeast	12	12.8	33	22.8	45	18.8
South	31	33	39	26.9	70	29.3
<i>Size of town</i>						
<5,000	9	9.6	19	13.1	28	11.7
5,001–20,000	15	16	20	13.8	35	14.6
20,001–50,000	18	19.1	14	9.7	32	13.4
50,001–10,000	19	20.2	29	20	48	20.1
10,001–1 million	17	18.1	42	29	59	24.7
>1 million	16	17	21	14.5	37	15.5
<i>Race/ethnicity</i>						
African–American	2	2.1	4	2.7	6	2.5
Asian–American	1	1.1	2	1.4	3	1.3
Caucasian	84	89.4	124	84.9	208	87
Latino	1	1.1	3	2.1	4	1.7
Mixed	2	2.1	7	4.8	9	3.8
Native American	1	1.1	2	1.4	3	1.3
Pacific Islander	2	2.1	1	0.7	3	1.3
Other	1	1.1	2	1.4	3	1.3
<i>HIV/AIDS status</i>						
HIV-positive	7	7.4	6	4.1	13	5.4
HIV-negative	77	81.9	131	90.3	208	87
Unsure	10	10.6	8	5.5	18	7.5
<i>Sexual orientation</i>						
Bisexual	29	30.9	55	37.9	84	35.1
Gay/homosexual	64	68.1	84	57.9	148	61.9
Heterosexual	1	1.1	1	0.7	2	0.8
Unsure	0	0	1	0.7	1	0.4
Queer	0	0	1	0.7	1	0.4
Other	0	0	3	2.1	3	1.3
<i>Relationship status</i>						
Dating	14	14.9	11	7.6	25	1.5
Have a primary partner	27	28.7	30	20.7	57	23.8
Married	15	16	31	21.4	46	19.2
Separated	9	9.6	9	6.2	18	7.5
Single	29	30.9	64	44.1	93	38.9

**Table 2** Descriptive statistics of sexual behaviors

Behaviors	Barebackers ( <i>n</i> = 94)		Non-barebackers ( <i>n</i> = 146)		Full sample ( <i>n</i> = 240)	
	<i>n</i> (%)	Mean (SD)	<i>n</i> (%)	Mean (SD)	<i>n</i> (%)	Mean (SD)
Being drunk on alcohol	26 (27.7)	1.39 (3.95)	21 (14.4)	0.79 (2.81)	47 (19.6)	1.03 (3.31)
Being high on crystal methamphetamine	6 (6.4)	0.52 (4.14)	4 (2.7)	0.18 (1.68)	10 (4.2)	0.31 (2.9)
Being high on other drugs	9 (9.6)	0.16 (0.63)	14 (9.6)	0.55 (2.55)	23 (9.6)	0.4 (2.03)
Unprotected sex with woman	17 (18.1)	1.18 (5.03)	33 (22.6)	1.8 (5.04)	50 (20.8)	1.80 (5.03)
Protected anal sex	52 (55.3)	3.47 (6.34)	72 (49.3)	2.71 (5.62)	124 (51.7)	3.01 (5.91)
UAI	85 (90.4)	5.50 (9.29)	4 (2.7)	0.58 (4.82)	89 (37.1)	6.76 (7.31)
Meeting men online for offline sex	77 (81.9)	4.02 (7.68)	76 (52.0)	1.71 (2.99)	153 (63.8)	2.61 (5.44)
Attending bareback party	7 (7.5)	0.09 (0.32)	1 (0.7)	0.02 (0.25)	8 (3.3)	0.05 (0.28)
Barebacking with HIV+/unknown partner	30 (31.9)	2.22 (8.38)				
Barebacking with HIV- partner	78 (83.9)	4.24 (8.66)				
Bareback partners	94 (100)	3.46 (8.03)				

**Table 3** Results of univariate analyses

Variables	$r_{pb}$	adj $R^2$	p	d
Perceived seriousness of HIV	0.154	0.02	0.017*	0.320
Perceived susceptibility of HIV	0.050	0.002	0.439	0.102
Perceived benefits	-0.148	0.022	0.021*	-0.323
Perceived barriers	-0.202	0.037	0.002**	-0.415
Self-efficacy for limiting HIV risk behavior	-0.272	0.07	0.000**	-0.567
Safer sex social norm perception	-0.287	0.079	0.000**	-0.608
Sexual sensation seeking	0.313	0.094	0.000**	0.677
UAI	0.496	0.243	0.000**	0.665
Meeting men online for offline sex	0.235	0.051	0.000**	0.474
Being drunk on alcohol	0.154	0.019	0.021*	0.175
Being high on crystal methamphetamine	0.075	0.001	0.261	0.081
Being high on other drugs	-0.049	0.002	0.460	-0.108

\* Statistically significant at  $\alpha$  0.05

\*\* Statistically significant at  $\alpha$  0.001

were significantly different on nine variables. Barebackers reported more frequently engaging in UAI compared with men who did not report bareback sex (barebackers mean 5.50; non-barebackers mean 0.58),  $r = 0.496$ ,  $p < 0.001$ . This behavior accounted for 24.3% of the variance in the variable. Compared with non-barebackers, barebackers reported more frequently meeting men online for offline sex (barebackers mean 4.02; non-barebackers mean 1.71),  $r = 0.235$ ,  $p < 0.001$ . Group membership explained 5.1% of the variance in the variable. Being drunk on alcohol in anticipation of/during sex was significantly related to barebacking,  $r = 0.154$ ,  $p < 0.05$ . Barebackers, more so than non-barebackers, reported being drunk on alcohol in anticipation of or during sex (barebackers mean 1.39; non-barebackers mean 0.79). Barebackers and non-barebackers were not significantly different in their

reported use of crystal methamphetamine or other illegal drugs in context of sexual activity. Sexual sensation seeking was significantly related to the grouping variable (barebackers mean 26.37; non-barebackers mean 23.39),  $r = 0.313$ ,  $p < 0.001$ . Group membership explained 9.4% of the variance in the variable.

There was a statistically significant relationship between perceived seriousness of HIV and reporting bareback sex (barebackers mean 16.48; non-barebackers mean 14.80),  $r = 0.154$ ,  $p < 0.05$ : Barebackers reported a greater degree of perceived seriousness of HIV than men not reporting bareback sex. The construct perceived susceptibility to HIV was not statistically significant. Reporting bareback sex was significantly related to lower perceived benefits of HIV prevention methods, such as using a condom (barebackers mean 20.13; non-barebackers mean 21.18)

$r = -0.148$ ,  $p < 0.05$ . In terms of perceived barriers to engage in HIV prevention behaviors, barebackers were more likely to report perceived barriers than were non-barebackers ( $r = -0.202$ ,  $p < 0.05$ ). It should be noted, however, that the inferential results from the AHBS must be viewed with caution because, as noted above, the internal consistency results for the scale in this sample suggested the scores on the measure have low reliability. Barebackers reported a lower degree of self-efficacy for LHRB (30.61, non-barebackers mean 32.79),  $r = -0.272$ ,  $p < 0.001$ . Group membership explained 7.0% of the variance in this variable. Lastly, group membership was significantly related to safer sex social norm perceptions,  $r = -0.287$ ,  $p < 0.001$  (barebackers mean 24.33; non-barebackers mean 27.93), and group membership explained 8.0% of the variance in the variable.

## Discussion

Among the present sample of adult MSM Internet users, less than half (39.2%) engaged in barebacking. This prevalence rate is similar to previous findings from US (Halkitis et al. 2003; Halkitis et al. 2005a, b) and England (Elford et al. 2007), providing evidence that the majority of MSM do not intentionally seek out condomless anal sex. However, the extent of barebacking among MSM clearly requires more research, with larger and more diverse samples, especially younger MSM, in order to understand the degree to which MSM risk HIV infection through the practice of bareback sex.

Men who engage in bareback sex are more likely to hold a lower educational level and, consistent with results from earlier research (Mansergh et al. 2002; Halkitis et al. 2003), perceptions of negotiated safety through serosorting seems their preferred method of risk reduction. Yet, the possibility of both HIV reinfection and seroconversion existed among barebackers in this sample. Eighty-five percent of HIV+ barebackers reported bareback sex with seroconcordant men, and 27.5% of barebackers who were HIV- or unsure of their HIV-status reported that their bareback partners were HIV+/unknown partners. Furthermore, 90.4% of barebackers reported also engaging in unprotected anal sex, and 18.0% self-reported unprotected sex with a woman in the past 2 months. This sample, therefore, consisted of about 10% MSM/W, and as suggested by others, a 'cross-over' HIV risk between MSM and the larger community exists (Bull et al. 2004; Wilton et al. 2005).

Consistent with the results of other empirical studies (Halkitis et al. 2005b; Mansergh et al. 2002), this investigation shows that men reporting bareback sex are significantly more likely to practice UAI. In fact, while only 2.7%

of non-barebackers reported UAI, 90.4% of men reporting bareback sex also reported engaging in UAI. This suggests, first, that men not reporting bareback sex typically refrain from any UAI, thus limiting the probability of HIV/STI transmission. Second, it appears plausible that a great proportion of UAI among MSM outside monogamous relationships can be categorized as barebacking. Third, current self-professed barebackers are largely the same men who engage in UAI. Accordingly, the presence of two separate groups, one group of men practicing 'unintentional' anal sex (i.e., as a result of poor planning or relapse) and a separate group engaging in 'intentional' bareback sex appears unlikely. The fact that risk factors associated with barebacking are also related to UAI (alcohol use, sensation seeking, lower perceived social and peer norms) adds credence to this argument.

Consequently, although early research suggested there was relative congruity between MSM and health professionals in their understanding of the term barebacking, the term may have developed too fast at the community-level for researchers to keep abreast, undermining researchers' understanding of the behavior and possibly the validity of extant empirical research about barebacking. New research (Huebner et al. 2006) supports this belief. In the present study, results of inferential tests, with  $r = 0.496$ , suggest there is a lack of concept discrimination between the two behaviors. This lends support to recent research offering evidence that MSM chiefly define barebacking as anal sex without a condom (Huebner et al. 2006; Halkitis et al. 2005a; Wilton et al. 2005). Moreover, some researchers (Halkitis et al. 2005b; Shidlo et al. 2005) speculate there is a critical distinction between barebacking as a behavior and as an identity in which a barebacker experiences bareback sex as ego-syntonic, that is, consistent with his sense of self. It seems likely that most MSM presently use the term referring to both sexual situations in which there is a clear intent to practice condomless anal sex and in which unprotected anal sex occurs as a result of poor planning or relapse. The fact is, the emergence of the term barebacking in the mid-1990s may be a linguistic manifestation, a neologism, of not only the changing nature of sexual risk taking among MSM, in which a rejection of condoms has become impenitent within some MSM communities, but also a cultural shift regarding norms for less safe sexual behaviors.

While previous studies confirmed that barebackers are more likely to abuse crystal methamphetamine and other drugs (Halkitis et al. 2005b; Mansergh et al. 2002; Parsons and Bimbi 2007), this is the first study to detect differences between the groups in use of alcohol, providing evidence that use of alcohol is an independent risk factor for barebacking among MSM, similar to the risk of UAI among MSM (Ekstrand et al. 1999; Kalichman et al. 1997b; Koblin et al. 2003; Strathdee et al. 1998).



Findings in the present study also extend health professionals' knowledge about the impact of the Internet by showing a relationship between barebacking and meeting men online for offline sex. In this sample, 82.0% of barebackers reported using this technological medium to find sex partners. Morin et al. (2003) have suggested that the Internet not only is instrumental in bringing bareback partners together online and offline, but also may increase the social pressure on a minority of MSM to conform to a social climate of bareback normalcy. The plentiful websites, listserves, chatrooms, and personal ads devoted to the topic attest to the fact that barebacking has become omnipresent online. The Internet's virtual social norm of unsafe sex thus presents limited opposition to barebacking and helps explain why some MSM develop along behavioral trajectories that lead to bareback sex. By extension, because this private behavior has become more public, it may have increased MSM's awareness of barebacking behavior, as suggested by previous research (Halkitis et al. 2003; Wolitski 2005). Not surprisingly, the majority of MSM has met sexual partners via the Internet (Benotsch et al. 2002; Bull et al. 2004).

Sexual sensation seeking was significantly associated with barebacking, corroborating earlier findings (Halkitis and Parsons 2003; Halkitis et al. 2005b; Mansergh et al. 2002) and suggesting that barebackers are sexual sensation-seekers who show a greater willingness to accept or even seek out risk in sexual encounters. Intense sexual experiences and pleasure-of-the-moment considerations appear to be pertinent factors involved in barebacking, more so than consideration of some future infection event.

This study is the first to apply behavioral science theory in research about barebacking.

To shed light on MSM's AIDS health belief perceptions, the AHBS was used. Consistent with previous qualitative findings (Carballo-Diéguez 2001) compared with men not reporting bareback sex, barebackers perceived more barriers and fewer benefits to limit HIV risk behaviors. Counterintuitively, compared with non-barebackers, barebackers perceived greater seriousness of HIV. These conflicting perceptions suggest a cognitive dissonance in which barebackers recognize the seriousness of the disease, yet value bareback sex to the extent that barriers to limit risk may seem insurmountable and benefits to avoid the risk minor. Compared with non-barebackers, barebackers reported significantly lower self-efficacy for LHRB. According to self-efficacy theory (Bandura 2004; Janz et al. 2002), if individuals do not have confidence in their ability to engage in safer sex behavior to prevent HIV infection, then there is little incentive for them to put forth extra effort to do so. This study suggests that beliefs of personal self-efficacy may (1) hold significant power to explain why some MSM practice unsafe sex and (2) point

to an important belief structure that is amenable to change. The fact that barebackers evidence low self-efficacy for limiting safer sex also aligns with their lack of perceiving safer sex social norms.

That a norm of unsafe sexual behavior in fact exists among some MSM was evidenced in this study by barebackers reporting a significantly lower perception of safer sex norms in their community compared with non-barebackers. For barebackers, this suggests the presence of a social structure that supports men interested in bareback sex. According to the Social Networks and Social Support Theory, interpersonal exchanges within a social network and the social norms and affirmation/disconfirmation provided by this network influence individuals' health behaviors (Heaney and Israel 2002). In effect, then, whether a real behavioral change has occurred or not, because the social boundaries of sexual risk taking among MSM have shifted, these broader community-level beliefs influence MSM's perceptions and may in turn shape their behaviors toward more sexual risk taking.

As evidenced not only by the present but also two other recent studies, the term barebacking is nebulous: It holds different meanings across serostatus (Halkitis et al. 2005a) and cultural groups (Wilton et al. 2005). Therefore, as proposed by others (Halkitis et al. 2005a; Huebner et al. 2006), understanding of the phenomenon of barebacking would be greatly furthered by inductively exploring the cognitive and affective parts of barebacking versus the behavior. This would help health professionals understand barebacking as a concept and the meaning various MSM communities ascribe to the term. The goal must be to develop a more accurate definition of barebacking, based on scientific, qualitative and quantitative, research. Similarly, continued research with a social network/social support anchor may help further uncover factors that help sustain barebacking not just as a behavior in context of HIV/AIDS health beliefs but also as a cultural phenomenon. Additional studies identifying other behavioral, psychosocial, situational, and cultural variables which could be related to sexual risk taking are needed. Methodologically, replication research would be informative. For example, the present study with similar variables included should be replicated with a non-Internet sample.

In terms of future application, UAI and barebacking are related concepts and should be addressed jointly as sexual risk behaviors that may transmit HIV/STIs. One prevention alternative that meets this goal is negotiated safety (Kippax et al. 1993). Blechner (2002) similarly proposes that HIV prevention messages emphasize that monogamous, committed, sexual relationships without constraints of safer sex might be a possibility for gay men. Such messages may also help increase men's sense of self-efficacy for LHRB

and favorably influence their perceptions of benefits and barriers of HIV prevention methods. These beliefs should be fostered by demonstrating the efficacy of monogamy and condom use. Alternatives for less risky ways to sexual fulfillment and satisfaction may in fact be well accepted in MSM communities. For example, rectal microbicides appear to have high acceptability among MSM (Carballo-Diéguez et al. 2000; Mansergh et al. 2003). For these factors, more focused and unique programmatic approaches are applicable and should recommend healthy sex lives to maintain overall wellness. It is critical that all aspects of a prevention program be developed with the wants, needs, and characteristics of the target audience.

Alcohol and sexual sensation seeking are part of the barebacker's sexual context and pose unique intervention challenges for outreach and mental health workers. One possible prevention strategy for these risk factors is Motivational Interviewing (Parsons 2005), and another is that of harm reduction. Research already suggests serosorting is used for this purpose among barebackers. Harm reduction involves alternative risk reduction options that may offer perfunctory, but viable HIV precautionary approaches, such as early withdrawal and strategic sexual positioning (Groves and Parsons 2006; Parsons and Bimbi 2007; Suarez and Miller 2001).

To counter the normalizing of bareback sex, it seems essential to encourage social norms of personal and social responsibility for safer sex and prevention of HIV transmission (Carballo-Diéguez 2001). Similarly to programs in the 1980s, community-driven health promotion and prevention messages could work to enhance MSM's sense of community and community empowerment with the goal of creating a norm in which barebacking is socially objectionable. Interventions with a social norm anchor should perhaps particularly appeal to men's sense of responsibility for decreasing transmission rates. According to Halkitis et al. (2005b), self-perceived responsibility for safer sex is lower among men who identify as barebackers than non-barebackers. Such prevention messages must carefully profile the target audience and also balance protection of the public's health with respect for individuals' right to make choices regarding their health. The role of the Internet is becoming clear as a setting in which MSM are comfortable in the context of sexual risk taking. Consequently, online health promotion constitutes a tenable venue that may reach men otherwise inaccessible to traditional prevention efforts. The Internet can be used to provide prevention information, referrals to services, and interactive interventions in a timely and cost-effective manner (Bull et al. 2001; Kalichman et al. 2002). Furthermore, specific subsets of MSM, such as barebackers, can be targeted with tailored messages by placing information on websites serving their interests (Wolitski

2005). Interestingly, even some bareback websites promote harm reduction by encouraging HIV testing, discussing HIV status with potential partners, and serosorting (Groves 2006). The acceptability and preliminary success of online intervention studies are promising (Bolding et al. 2004; Rhodes 2004).

In light of the above discussion, it is important to consider the limitations of this study. Because of the 'hidden' nature of the MSM population in general, it is impossible to draw a probability sample of MSM Internet users, the study's target population. An attempt was made to increase representativeness by defining the sample as a subset of web-users based on specific characteristics. Furthermore, this study, as most other studies investigating barebacking, included predominantly Caucasian, gay, and bisexual male volunteers who were well educated. However, it is important to note that the nature of the research topic and the population necessitate relying on non-random samples. For unknown reasons, the average age of respondents in this sample (45.5 years) was higher than that reported in previous studies of MSM Internet users (Fernández et al. 2004; Groves and Parsons 2006; Halkitis and Parsons 2003; Rhodes et al. 2002), and this may have influenced the results. The study's non-experimental design also excludes causal conclusions. As in most behavioral HIV-related research, data-collection methods in this study relied on self-reports of behaviors, which are susceptible to response biases. Studies suggest, however, that respondents provide more honest responses and express increased self-disclosure in online studies as compared with offline surveys (Joinson 1999; Martin and Nagao 1989; Servan-Schreiber and Biknik 1989). Another Internet-related limitation is that the actual data collection environment can be neither controlled nor monitored (Daley et al. 2003). There may, therefore, have been serious co-occurring interferences to testing, such as influences from friends or participants being tired, intoxicated, etc. However, these problems are equally present in traditional data collection (Mustanski 2001).

In conclusion, this research offers additional preliminary understanding regarding the phenomenon of barebacking. Along with the few earlier empirical investigations of barebacking, the results provide a starting point for further exploration of psychosocial, behavioral, and cultural factors surrounding barebacking, which continue to be a risk factor for HIV infection and, consequently, worthy of continued public health research.

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