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Anonymous sex and HIV risk practices among men using the Internet specifically to find male partners for unprotected sex

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Abstract

Objectives: To examine the popularity of anonymous sex practices among men using the Internet to find male partners for unprotected sex, and how anonymous sex relates to involvement in other HIV-related risk behaviours, and to investigate the factors associated with engaging in anonymous sex.

Study design: Structured telephone interviews were conducted with men who used the Internet specifically to find male partners for unprotected sex. Random sampling from 16 websites was used to obtain a national sample. The data reported in this paper were based on quantitative interviews collected with a cross-sectional study design.

Methods: Between January 2008 and May 2009, confidential telephone interviews lasting approximately 1–2 h were completed with 332 men. Participants were paid $35 for their participation.

Results: Most of the men (67.4%) liked anonymous sex, and slightly more than half (51.2%) had engaged in the behaviour during the month prior to interview. Involvement in anonymous sex was associated with greater involvement in a variety of human immunodeficiency virus (HIV)-related risk practices, such as illegal drug use, number of sex partners and amount of unprotected sex. Four factors were associated with having vs not having anonymous sex: (1) being HIV positive; (2) answering all of the HIV-related knowledge questions correctly; (3) deriving greater enjoyment from having sex in public places, such as parks, public toilets or adult book shops; and (4) greater impulsivity. Seven factors were associated with greater vs lesser involvement in anonymous sex among those practising the behaviour: (1) being involved in a relationship with a long-term partner; (2) liking to have sex in public places; (3) using bareback-oriented websites to identify sex partners; (4) greater impulsivity; (5) low level of condom use self-efficacy; (6) greater knowledge

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Ethical approval

Prior to implementation in the field, the research protocol was approved by the institutional review boards at Morgan State University, where the principal investigator and one of the research assistants were affiliated, and George Mason University, where the other research assistant was located.

Competing interests

None declared.

about HIV/acquired immunodeficiency syndrome; and either (7a) severe childhood maltreatment or (7b) Caucasian race.

Conclusions: Men in this population often sought anonymous sex, and this practice was related to involvement in a variety of risky behaviours, such as illegal drug use and the number of recent sex partners (among others). Interventionists should address anonymous sex practices among Internet-using, risk-seeking men in order to reduce the overall levels of HIV risk involvement.

Keywords

Anonymous sex; Men who have sex with men; HIV risk practices; Internet

<A> Introduction

Although widely acknowledged as a common risk factor for human immunodeficiency virus (HIV) transmission among men who have sex with men (MSM), anonymous sex has been the subject of relatively little research over the years, particularly quantitative assessments. A number of studies (cited/summarized below) have tried to examine certain aspects of anonymous sex by investigating sex in public places (e.g. public toilets, adult book shops, public parks) and/or in non-prostitution-related, sexually-oriented commercial venues (e.g. gay bars, bath houses). However, a general paucity of studies focused specifically on anonymous sex led Semple et al.[1] to note that ‘sexual behavior that occurs with anonymous partners is an important, yet understudied area in prevention research’ (p. 71).

Prevalence-related information is especially lacking in the scholarly literature. Sex with partners who are barely known to the individual – for example, with men who are met online – is quite common among MSM, with up to half of all MSM reporting meeting at least one of their recent sex partners online.[2] This percentage appears to be rising.[2,3] Other research has shown that frequenting public sex venues (where anonymous sex is often the norm) is commonplace among MSM, with approximately half of all MSM acknowledging that they had recently gone to such venues.[4,5] A sizable proportion of the men who frequent public sex venues alternate their time between different types of public sex venue (e.g. bath houses, public parks, adult book shops).[4] Relatively recent evidence suggests that, during the 1990s and 2000s, there was a re-emergence of sex in public places, implying a simultaneous increase in MSM’s opportunities for and interest in engaging in anonymous sex.[6,7]

When they have anonymous sex, MSM report a variety of risky sexual practices with their anonymous sex partners. For example, based on a study of sex in public spaces on college campuses (e.g. locker rooms, men’s toilets, etc.), Reece and Dodge[6] reported that very few of their study participants expressed concern about contracting any sexually transmitted infections other than HIV, and condom use was reported to be nearly nil among men in their study. Similar findings were reported by Flowers et al.,[8] leading them to note that ‘within the context of the [public] park, the risk of sexually transmitted infections did not figure as an important feature of men’s sexual decision making’ (p. 488). In their work on men cruising for sex in public parks, French et al.[9] noted that 85% of the men in their research reported oral sex and 61% reported anal sex in that venue. MSM’s use of public parks for sex was frequent, with 62% of their study participants saying that they went to a public park at least

once a month for sex. Frankis and Flowers[10] also conducted a study of MSM using public parks for sex, and found that 20% of their sample's anal sex partners came from this venue. Semple al.[1] reported that nearly half of the HIV-positive men taking part in their study had had at least one anonymous sex partner during the 4 months prior to interview. Most often, they engaged in oral sex with these partners (98%), but quite often they also reported anal sex (69%). Nearly all of the oral sex reported with anonymous partners was unprotected (99%), as was most of the anal sex reported with anonymous partners (66%). Semple et al.[1] noted that most (71%) of the men in their research sample did not disclose their HIV-positive serostatus to their anonymous sex partners.

In great part, this is because there is a strong set of social norms that establish the importance of silent or nearly-silent interactions whenever anonymous sex is involved. In such encounters, communication is almost always inhibited and very limited,[6,7,9,11,12] principally because silence contributes to the anonymity that draws many men to the public/commercial sex environments to have anonymous sex in the first place. Reece and Dodge[6] noted that 'verbal communication between sexual partners was unexpected and even inappropriate; indeed, verbal communication was a violation of the norms of the sexual space. As a result, there was a low likelihood that disclosures about HIV or other infections or discussions about the use of condoms or other safer sex methods would occur' (p. 122). Similarly, Elwood et al.[11] commented that 'acts of unprotected anal sex were attributed to fear of breaking the communication norm for silence in bathhouse public areas. In the context of MSM's condom use intentions in bathhouses, norms regarding silence were more strongly associated with condom use than were attitudes toward condom use' (pp. 289–290). Other authors[13] have concluded that 'risky behavior may occur in situations in which the sexual activity of … gay/bisexual men is disconnected from … interpersonal relations and interaction/negotiation' (p. 483). Parsons and Halkitis[5] found that, compared with men who do not have sex in these environments, men who do have sex in commercial sex environments perceive themselves to have less responsibility towards protecting their sex partners from HIV infection. Additionally, sex in public cruising settings often occurs as hidden, illicit encounters with minimal influence of prevention messages or normative influences regarding expectations for safer sex.[13] Similar observations have also been made by others.[14–16]

In light of this lack of communication and the generally impersonal nature of anonymous sex encounters, it is not surprising that involvement in this practice has been linked to a variety of risky behaviours. For example, having sex in public sex venues (where anonymous sex is commonplace) has been linked with an increased risk of methamphetamine use during sex.[15,17] The use of ecstasy, methamphetamines, ketamine and rohypnol (the so-called 'party drugs') is more common among men who have sex in public sex venues than it is among those who do not.[4,5,18] Moreover, use of methamphetamine has been associated with high rates of having anonymous sex partners and with purposely seeking out risky sex partners.[18,19] Semple et al.[1] reported a greater use of illegal drugs (type not specified) among men who had had at least one anonymous sex partner recently compared with men who had not. Findings such as these led Parsons and Halkitis[5] to conclude that 'the use of these [stimulant] drugs by CSE-going [commercial sex environment] men could also be related to "cognitive escapism"… MSM may want to escape from thoughts of safer sexual behaviours,

and thus actively choose to use recreational drugs to facilitate escape and look for sex partners in CSEs where anonymous sex acts with multiple partners are more normative' (p. 823).

Moreover, having sex in public cruising places has been associated with involvement in higher-risk sexual activities,[12,13,20] particularly unprotected anal sex with non-primary partners.[4,7,8] Having sex in public and/or commercial sex environments has also been linked with higher levels of sexual compulsivity, having more unprotected oral sex, having more unprotected anal sex, and having a greater number of recent sex partners.[5,7,10–12]

Not surprisingly, fairly high HIV seroprevalence rates have been reported among men using public sex venues,[4,10] with as many as one-quarter of all MSM frequenting such places being HIV positive. HIV-positive men attending commercial sex venues have been shown to be more likely to report having engaged in unprotected anal sex than their counterparts who do not go to such places for sex.[5] The same has been found to be true for sex in public sex environments, such as public parks.[10] Non-disclosure of an HIV-positive serostatus has been shown to be more common among men having sex in public venues than it is among men having sex in private settings.[16] Men 'referred to an "unspoken rule" that men in public sex environments who did not initiate a discussion on [HIV serostatus] disclosure were either HIVinfected or did not care about their health'[15] (p. 94). Similar norms have been described by Richters.[12]

The present paper examines anonymous sex practices in a population of very-high-risk MSM; namely, those who use the Internet specifically to find other men with whom they can engage in unprotected sex. This paper focuses on the following research questions:

(1) How prevalent is anonymous sex (and a preference for engaging in anonymous sex) in this population?

(2) What is the relationship between anonymous sex and involvement in other HIV-related risk practices?

(3) What factors differentiate men who have recently engaged in anonymous sex from those who have not?

(4) Among men who reported recent involvement in anonymous sex, what factors differentiate greater vs lesser involvement in anonymous sex?

In terms of the hypotheses guiding these research questions, there is no way to quantify the anticipated prevalence of anonymous sex, as examined in Question 1 above. Previous studies simply have not addressed the extent to which MSM like, actively seek out or engage in anonymous sex. With regard to Question 2, based on previous studies, it is hypothesized that anonymous sex will be related closely and directly to involvement in other HIV-related risk practices, such as engaging in unprotected sex, number of sex partners and use of illegal drugs. Regarding Questions 3 and 4, several types of factors are hypothesized to relate to men's anonymous sex practices. These factors are based on the present study's underlying Syndemics Theory conceptual approach (see below), and include demographic variables (e.g. greater involvement in anonymous sex is hypothesized to be observed among men who are younger, not involved in a relationship with someone and HIV positive, among other

factors), childhood maltreatment experiences (more maltreatment would be expected to be related to greater involvement in anonymous sex), psychological and psychosocial functioning (e.g. lower self-esteem, more depression, more impulsivity, etc. would be hypothesized to be related to greater involvement in anonymous sex), and sex-related preferences (greater involvement in anonymous sex would be hypothesized among men who liked sex in public places or to have sex that is ‘wild’ or ‘uninhibited’)

<A> Methods

<B> Sampling and recruitment

The data reported in this paper come from the Bareback Project, a National Institute on Drug Abuse-funded study of men who use the Internet specifically to find other men with whom they can engage in unprotected sex. The data were collected between January 2008 and May 2009. A total of 332 men were recruited from 16 different websites. Some of the sites catered exclusively for unprotected sex (e.g. Bareback.com, RawLoads.com). Some of the sites did not cater exclusively for unprotected sex but made it possible for site users to identify which individuals were looking for unprotected sex (e.g. Men4SexNow.com, Squirt.org). A nationwide random sample of men was derived, with random selection being based on a combination of the first letter of the person’s online username, his race/ethnicity (as listed in his profile), and the day of recruitment. Recruitment efforts were undertaken 7 days/week, during all hours of the day and night, variable from week to week throughout the duration of the project. This was done to maximize the representativeness of the final research sample in recognition of the fact that different people use the Internet at different times.

To be eligible to participate in the study, several criteria had to be met. First, men had to be aged 18 years or older. Second, they had to be residents of the USA. This was important because many of the websites used for recruitment had an international clientele, and the goal of the Bareback Project was to keep this a US-focused study. Third, men had to have posted a profile on a bareback-focused website, or a sex-seeking advertisement specifically indicating an interest in finding partners for unprotected sex on an MSM-oriented website that was not bareback-focused.

Depending upon the website involved, men were initially approached via instant message or email (much more commonly via email). A brief overview of the study was provided as part of the initial approach and informed-consent-related procedures. Likewise, a website link to the project’s online home page was also made available to them prior to giving their consent to participate, to provide men with additional information about the project and to help them feel secure in the legitimacy of the research endeavour. All men were given the opportunity to ask questions about the study before deciding whether or not to participate. Interviews were conducted during all hours of the day and night, 7 days/week, based on interviewer availability and participants’ preferences, in order to maximize convenience to the participants.

Prior to recruitment and data collection, the two interviewers (with the study’s principal investigator serving as a third interviewer) underwent an intensive training period, lasting

approximately 3 weeks. During this time, all recruitment-related protocols were explained, as were the procedures to be followed to secure proper informed consent to participate. The training also included numerous rehearsals of the interview process, focusing on how to conduct the interviews, build rapport with study participants, answer respondents' questions, and obtain clarification for ambiguous responses provided by study participants. Mock interviews were conducted throughout the training period to familiarize the interviewers with the questionnaire,the types of questions that study participants were likely to ask (and how to respond to those questions), and the data collection process. This included specific instructions on how to follow the questionnaire's skip patterns and the importance of recording clear, legible responses on the hard-copy questionnaires, as well as providing written supplemental interviewers' notes, as needed, to document any additional details that were relevant to a particular interview.

Participation in the study entailed the completion of a one-time, confidential telephone interview covering a wide array of topics. The questionnaire was developed specifically for use in the Bareback Project, with many parts of the interview derived from standardized scales used previously and validated by other researchers. The study and questionnaire utilized a Syndemics Theory-based approach, which has been shown to be an effective way of conceptualizing thefactors associated with risk taking in this population.[21,22] Accordingly, the interview covered such subjects as: degree of 'outness', perceived discrimination based on sexual orientation, general health practices, HIV testing history and serostatus, sexual practices (protected and unprotected) with partners met online and offline, risk-related preferences, risk-related hypotheticals, substance use, drug-related problems, Internet usage, psychological and psychosocial functioning, childhood maltreatment experiences, HIV/acquired immunodeficiency syndrome (AIDS) knowledge, and some basic demographic information. Interviews lasted an average of 69 [median 63, standard deviation (SD) 20.1, range 30–210] min. Men who completed the interview were compensated $35 for their time. Prior to implementation in the field, the research protocol was approved by the institutional review boards at Morgan State University, where the principal investigator and one of the research assistants were affiliated, and George Mason University, where the other research assistant was located.

<B> Measures used

Two questions were used to assess anonymous sex in this research. First, men were asked a simple 'yes/no' question about whether or not they liked having anonymous sex. Anonymous sex was defined for them as 'sex with persons you know nothing about' and, whenever additional clarification was necessary to facilitate answering, this was followed by 'sex with men whom you would not be able to call or find again easily if you decided that you wanted to hook up with them again sometime'. Second, men were asked how many times they had engaged in anonymous sex during the 30 days prior to interview.

For Question 2, a number of HIV risk practices, all using a past-30-day time frame of reference, were examined. These included: overall proportion of sex acts involving the use of condoms (a continuous measure based on responses to separate items enquiring about oral, anal and vaginal sex), proportion of anal sex acts involving the use of condoms (a

continuous measure derived from the variables just described), overall proportion of sex acts involving internal ejaculation (a continuous measure based on responses to separate items enquiring about where ejaculation occurred during oral, anal and vaginal sex), proportion of anal sex acts involving internal ejaculation (a continuous measure derived from the items just described), and amount of illegal drug use (a continuous measure based on the quantity and frequency of use of each of nine different types of illegal drugs).

For Questions 3 and 4, several measures assessing psychological/psychosocial functioning were examined as potential predictor variables. These included self-esteem (using the Rosenberg self-esteem scale,[23] Cronbach's alpha=0.89), impulsivity (derived from the Barratt Impulsiveness Scale,[24] Cronbach's alpha=0.76), depression (using the Center for Epidemiologic Studies Depression Scale,[25] Cronbach's alpha=0.93), optimism about the future (using the Life Orientation Test–Revised,[26] Cronbach's alpha=0.78), current life satisfaction (adapted from the Satisfaction with Life scale,[27] Cronbach's alpha=0.83), partner communication (adapted from the Personal Report of Communication Apprehension scale,[28] Cronbach's alpha=0.78), attitudes towards condom use[29] (Cronbach's alpha=0.91), condom use self-efficacy[30] (Cronbach's alpha=0.86), HIV/AIDS information burnout (derived from the HIV Knowledge Questionnaire,[31] Cronbach's alpha=0.76) and childhood maltreatment experiences (separate measures for sexual abuse, physical abuse, emotional abuse and neglect, taken from the Childhood Trauma Questionnaire,[32] Cronbach's alpha=0.94).

In addition, for Questions 3 and 4, several demographic measures were examined as potential predictors. These included age (continuous), educational attainment (continuous), race/ethnicity (categorical), HIV serostatus (HIV positive vs HIV negative), population density in the area of residence (continuous) and relationship status ('involved' with an intimate partner vs single/not 'involved'). Also, measures indicating how men preferred to have sex were examined, including how much they liked to have sex that was 'wild' or 'uninhibited' (self-defined; continuous), how much they liked to have sex that was physically rough (self-defined; continuous), how much they liked to have sex that was long-lasting (self-defined; continuous), how much they liked to have sex in bath houses (continuous), how much they liked to have sex in public places (continuous), and how aroused they were by ejaculatory fluids (continuous).

<B> Analysis

All data were analysed using Statistical Analysis System Version 9.2. Descriptive statistics were used to examine Question 1, pertaining to the prevalence of anonymous sex. For Question 2, examining the relationship between anonymous sex and involvement in other risk practices, whenever the independent variable was dichotomous in nature (e.g. whether or not someone had engaged in anonymous sex) and the dependent variable was continuous (e.g. proportion of sex acts involving condom use, amount of illegal drug use), Student's *t*-tests were used. In instances in which both measures were dichotomous, odds ratios (OR) and 95% confidence intervals (CI) were computed.

For Questions 3 and 4, the analysis was undertaken in two steps. During the first step, bivariate analyses were conducted to examine the relationships between the independent

variables and the main outcome measures at hand. Then, all items for which significant ($P<0.05$) or marginal ($0.10>P>0.05$) relationships were obtained in the bivariate analyses were entered simultaneously into a multivariate equation to determine which contributed uniquely and significantly to the model. Non-significant items were removed in a stepwise fashion until a bestfit equation consisting solely of significant predictors could be derived. For Question 3, the dependent variable (engaging vs not engaging in anonymous sex) was dichotomous. Therefore, multivariate logistic regression was used. The pseudo-R^2 explained variance coefficient is reported, along with the Hosmer-Lemeshow goodness-of-fit Chi-squared statistic. For readers unfamiliar with the Hosmer-Lemeshow statistic, a multivariate logistic regression equation is deemed to represent a good fit with the data when this Chi-squared test is not significant (with higher P-values indicating a better fit with the data). For Question 4, the dependent variable (number of times engaged in anonymous sex during the previous 30 days) was continuous. Therefore, multiple regression was used. For all results, $P<0.05$ was taken to indicate significance.

<A> Results

<B> Sample

In total, 332 men participated in the study. They ranged in age from 18 to 72 (mean 43.7, SD 11.2, median 43.2) years. Racially, the sample was a fairly close approximation of the American population, with 74.1% being Caucasian, 9.0% each being African American and Latino, 5.1% self-identifying as biracial or multiracial, 2.4% being Asian, and 0.3% being Native American. The large majority of the men (89.5%) considered themselves to be gay, and 10.2% said that they were bisexual. On balance, men participating in the Bareback Project were fairly well educated. About one in seven (14.5%) men had completed their high school education, 34.3% had some college experience without earning a college degree, 28.9% had a Bachelor's degree; and 22.3% were educated beyond Bachelor's level. Slightly more than half of the men (59.0%) reported being HIV positive; most of the rest (38.6%) were HIV negative.

<B> Prevalence information

More than two-thirds of the men participating in the study (67.4%) reported that they liked anonymous sex. More than half of the sexually active men (51.2%) reported that they had engaged in anonymous sex at least once during the month prior to interview. Additionally, more than one in nine men who said that they disliked anonymous sex reported that they had recently engaged in this behaviour anyway. Among men who had engaged in anonymous sex recently, the mean number of encounters during the previous 30 days was 7.8 (SD 12.5, range 1–120).

<B> Anonymous sex and involvement in risky behaviours

Men who liked anonymous sex said that they had engaged in protected sex less than half as often as their counterparts who disliked anonymous sex (6.0% vs 12.6%, $t=2.78$, $P=0.006$). This was true particularly with regard to unprotected anal sex (13.5% vs 25.4%, $t=2.87$, $P=0.005$). Moreover, men who liked anonymous sex had nearly twice as many sex partners during the month prior to interview compared with men who disliked anonymous sex (13.4

vs 6.9, t=3.17, P=0.002). Although total illegal drug use was comparable for men who liked and disliked anonymous sex (t=1.02, P=0.309), the former group were more likely to report recent use of an illegal drug (OR 1.69, 95% CI 1.00–2.87, P=0.039), particularly an illegal drug other than marijuana (OR 2.05, 95% CI 1.06–3.99, P=0.022).

Mixed findings were obtained for comparisons between men who had engaged in anonymous sex during the month prior to interview and those who had not. The two groups did not differ with regard to the frequency of condom use overall, the frequency with which they used condoms for anal sex, or the total amount of illegal drug use reported. In contrast, men who had engaged in anonymous sex during the month prior to interview acknowledged having had more sex involving internal ejaculation (41.0% vs 33.4%, t=2.31, P=0.022), which is attributable in large part to anal sex involving internal ejaculation (t=2.06, P=0.041). Moreover, the former group reported having had nearly three times as many sex partners during the previous month than the latter group (16.6 vs 5.7, t=5.94, P<0.0001). They were also substantially more favourably inclined towards having sex in places such as bath houses or sex clubs (OR 2.53, 95% CI 1.51–4.26, P=0.0002). The former group were also more likely to have used an illegal drug during the preceding 30 days (OR 1.86, 95% CI 1.12–3.09, P=0.011), particularly an illegal drug other than marijuana (OR 1.75, 95% CI 1.00–3.10, P=0.038). Men who had engaged in anonymous sex recently were more likely to report recently having had sex while under the influence of alcohol and/or illegal drugs (OR 1.78, 95% CI 1.09–2.91, P=0.015), and they experienced a greater number of drug-related problems (0.9 vs 0.5, t=2.17, P=0.031) than their peers who had not engaged in anonymous sex recently.

Among men who reported any recent involvement in anonymous sex, no significant relationships were found between the number of times they had engaged in this practice and the frequency of involvement in other risky practices. This was true for the proportion of all sex acts involving condoms, the proportion of all anal sex acts involving the use of protection, the proportion of all sex acts involving internal ejaculation, the proportion of anal sex acts involving internal ejaculation, overall amount of illegal drug use, and whether or not men had used an illegal drug during the past month.

<B> Predictors of having anonymous sex (vs not engaging in this behaviour) among sexually active men

Regarding their personal and demographic characteristics, on most dimensions, no significant differences were found between men who did and did not report engaging in anonymous sex. This was true with respect to their: age, race, educational attainment, sexual orientation, population density where they lived, level of HIV-related knowledge levels, overall health index score, number of persons known to have died from AIDS or who were currently living with HIV, preference for having sex while under the influence of alcohol and/or other drugs, level of depression, whether or not they had been maltreated severely during their formative years, or the amount of time they spent online searching for sex partners on a typical day. In contrast, men who considered themselves to be sexual bottoms were significantly more likely to have engaged in anonymous sex recently than their sexually versatile or sexual top counterparts (OR 1.63, 95% CI 1.00–2.66, P=0.038). HIV-

positive men were nearly twice as likely as other men to report having had anonymous sex recently (OR 1.91, 95% CI 1.16–3.15, P=0.007). Men who had engaged in anonymous sex recently were substantially more likely to score 100% on the HIV/AIDS knowledge items than men who had not engaged in anonymous sex recently (OR 4.15, 95% CI 1.26–15.10, P=0.008). Additionally, there was a tendency for men who were involved in relationships with a steady partner to report more anonymous sex than their 'single' counterparts (t=1.91, P=0.058).

In terms of sex-related preferences, in comparison with men who had not engaged in anonymous sex recently, those who had engaged in anonymous sex recently preferred their sex to be rougher (OR 1.13, 95% CI 1.02–1.26, P=0.026), preferred their sex to be 'wild' or 'uninhibited' (OR 1.24, 95% CI 1.03–1.49, P=0.027), were more inclined to like having sex in public venues such as parks, public toilets or book shops (OR 1.18, 95% CI 1.10–1.26, P<0.0001), and were more aroused by ejaculatory fluids (OR 1.06, 95% CI 1.01–1.12, P=0.015). Men who had engaged in anonymous sex said that they were more likely to use barebackoriented websites to find sex partners (OR 1.46, 95% CI 1.13–1.90, P=0.004) and to find sex partners with whom they could engage in unprotected sex (OR 1.33, 95% CI 1.09–1.63, P=0.005). There were, however, no differences between these comparison groups based on how long they liked their sexual sessions to last, their perceptions of the accuracy of other men's online profiles, or their perceptions of the accuracy of information provided to them verbally by other men about their HIV serostatus.

With regard to their psychological/psychosocial functioning, compared with men who had not engaged in anonymous sex recently, those who had engaged in anonymous sex recently were: more impulsive (OR 1.85, 95% CI 1.16–2.95, P=0.010), more likely to have negative attitudes towards condom use (OR 0.61, 95% CI 0.43–0.85, P=0.004), more likely to have lower levels of condom use self-efficacy (OR 0.60, 95% CI 0.40–0.90, P=0.014), and more likely to feel burned out with regard to HIV-related information (OR 1.84, 95% CI 1.21–2.81, P=0.005). The two groups did not differ with regard to their overall levels of self-esteem, current life satisfaction, optimism about the future, partner communication skills or depression. They also did not differ in terms of any of the childhood maltreatment measures examined.

Items found to be significant in the bivariate analyses were entered into a multivariate logistic regression equation to determine which items contributed uniquely and significantly to the determination of whether or not someone had engaged in anonymous sex recently. The multivariate analysis yielded an equation comprised by four items (see Table 1). These were (1) being HIV positive (β=0.21, P=0.003); (2) answering all of the HIV-related knowledge questions correctly (β=0.22, P=0.008); (3) deriving greater enjoyment from having sex in public places, such as parks, public toilets or adult book shops (β=0.32, P<0.0001); and (4) greater impulsivity (β=0.20, P=0.006). Together, these items explained approximately 19.0% of the variance. The overall multivariate model was found to be a good fit with the data, as evidenced by the non-significant (and nowhere near attaining significance) Hosmer-Lemeshow Chi-squared statistic (χ^2_{8df}=6.18, P=0.627).

<B> Predictors of having more (vs less) anonymous sex among sexually active men who reported engaging in the practice recently

For all of the demographic and background-type measures except one, the amount of recent anonymous sex activity was not found to differ among sexually active men. This was true for: age, relationship status, educational attainment, sexual orientation, sexual role preference (top,bottom, versatile), population density in their area of residence, HIV serostatus, preference for sex partners' HIV serostatus, overall health practices, and the number of people known to the person who are living with HIV or who have died from AIDS. The one exception pertained to race: among sexually active men who had engaged in anonymous sex recently, Caucasian men reported having had slightly more than half as many anonymous sex encounters as their non-White counterparts (6.5 vs 11.5, t=2.22, P=0.028).

Most of the sex-related preference measures were found to be unrelated to the number of times that sexually active men who had engaged in anonymous sex recently reported having practised this behaviour. This was true with regard to: how rough men liked their sex, how long they preferred their sexual sessions to last, the extent to which they considered it important to have sex that was 'wild' or 'uninhibited', the extent to which they liked having sex in bath houses or sex clubs, and the extent to which they were aroused by ejaculatory fluids. It was also true with respect to how they perceived the accuracy of men's online profiles vis-a-vis HIV information, and with respect to how they perceived the accuracy of men's personally discussed HIV serostatus information. A few significant relationships were found, however. One of these was liking sex in public places, such as parks, public toilets or adult book shops. The more that men enjoyed having sex in these venues, the more they tended to have anonymous sex (F1,148df=11.35, P=0.001). Also, the more time that men reported spending searching the Internet for sex partners during the previous month, the greater the number of times they reported having engaged in anonymous sex ($F_{1,148df}$=5.53, P=0.020). Additionally, the more that men used the Internet specifically to identify partners with whom they could engage in unprotected sex, the fewer the number of times they reported engaging in anonymous sex ($F_{1,148df}$=4.07, P=0.045). The greater the level of knowledge about HIV/AIDS and HIV transmission, the fewer the number of times that they reported engaging in anonymous sex ($F_{1,148df}$=7.80, P=0.006).

All of the psychological/psychosocial functioning measures were found to be unrelated to the number of times that sexually active men who had recently engaged in anonymous sex reported having practised this behaviour. This is true for optimism about the future, current life satisfaction, self-esteem, depression, impulsivity, condom use self-efficacy, overall attitudes towards condom use, partner communication, and HIV information burnout. Similarly, all of the childhood maltreatment experience measures were found to be unrelated to the number of times that the men had engaged in anonymous sex.

Items found to be significant in the bivariate analyses were entered into a multiple regression equation to determine which items contributed uniquely and significantly to determination of the amount of recent anonymous sex reported by sexually active men who acknowledged engaging in this behaviour at least once during the previous month. The multivariate analysis resulted in the derivation of two similar models (see Table 2). Each model contains seven

items, six of which are common to both models and, in each instance, one of which is unique to each model. Both models explain comparable amounts of variance (23.6%). In both models, being involved in a relationship with a long-term partner was associated with a greater number of anonymous sex encounters. In both models, generally liking to have sex in public venues was linked with a greater number of anonymous sex encounters. In both models, the more that men reported using bareback-oriented websites to identify partners with whom they could engage in unprotected sex, the fewer the number of times they reported engaging inanonymous sex. In both models, greater impulsiveness was associated with fewer anonymous sex encounters. In both models, the men who had the most anonymous sex reported the lowest levels of condom use self-efficacy. In both models, greater knowledge about HIV/AIDS and HIV transmission was associated with fewer anonymous sex encounters. In Model 1, men who had been severely maltreated during their formative years reported significantly more anonymous sex encounters, whereas in Model 2, Caucasian men reported significantly less anonymous sex encounters than their peers who were members of racial minority groups.

<A> Discussion

Before discussing the main findings obtained in this research, the author would like to acknowledge a few potential limitations of this study. First, all data for the Bareback Project are based on uncorroborated self-reports. Therefore, the extent to which respondents under- or overreported their involvement in risky behaviours is unknown. In all likelihood, the self-reported data can be trusted, as previous authors have noted that individuals in their research studies (which, like the present study, have been based on MSM populations and HIV-related subject matter) have provided accurate information about their behaviours.[33] This is especially true for self-reported measures that involve relatively small numbers/ enumerations (e.g. number of times of having a particular type of sex during the previous 30 days), which characterize the substantial majority of the information collected in the present study.[34] Other researchers have also commented favourably on the reliability of self-reported information in their studies regarding topics such as condom use.[35]

A second possible limitation pertains to recall bias. For the majority of the measures used, respondents were asked to report their beliefs, attitudes and behaviours during the past 7 or 30 days. These time frames were chosen specifically: (1) to incorporate sufficient time in the risk behaviour questions' time frames so as to facilitate meaningful variability from person to person, and (2) to minimize recall bias. The exact extent to which recall bias affected the data cannot be assessed, although other researchers who have collected data similar to that captured in the Bareback Project have reported that recall bias is sufficiently minimal that its impact upon study findings is likely to be small.[36] Generally speaking, this seems to be especially true when the recall period is kept small,[37,38] as was the case for almost all of the main measures used in the present study. Fenton et al. prepared a valuable article on the subject of different types of bias as they apply to HIV/sex-related research; their summary of the literature[37] is well worth consulting.

Despite these potential limitations, the present author still believes that the current study has much to offer. First, this study demonstrated that anonymous sex is desired among MSM

who use the Internet to identify potential sex partners and, quite commonly, a practice in which these men engage. It was, in fact, practised approximately twice per week among men who reported any recent anonymous sex activities. Compounding this situation, the present study found a close relationship between anonymous sex and sexual risk-taking practices. Men who liked anonymous sex reported half as much condom use and twice as many sex partners during the month prior to interview as their counterparts who disliked anonymous sex.

These findings indicate a need for intervention programmes targeting high-risk MSM to address anonymous sex; this is something that few such programmes have undertaken. In particular, interventionists need to work with members of this target population to identify other sexual practices that can provide some of the same sexual thrills as sex with unknown partners, but in a manner that entails less risk to the men involved. A key issue here is identifying sexual practices that can serve as functional equivalents and that will be palatable to MSM. Additionally, since most anonymous sex encounters involve little to no communication with one's partner(s),[6,7,9,11,12] intervention programmes working with MSM to reduce anonymous sexrelated HIV risk must incorporate population-specific strategies to bolster partner communication skills and practices. This means not only instructing men about the importance of speaking with their partners about HIV and sexual safety, but also role playing specific ways in which they can try to introduce such discussions into their encounters with anonymous sex partners. Given the sociosexual norms pervading anonymous sex among MSM, this will be a formidable task.

Another set of important findings in the present study pertained to the part of the analysis focusing on the factors differentiating between men who had engaged in anonymous sex recently and those who had not. HIV-positive men were more than twice as likely as their HIV-negative or serostatus-unknown counterparts to report recent anonymous sex activities. With partner communication typically being minimal or non-existent in these encounters, this finding is of particular concern from a public health standpoint. It suggests that HIV-positive men who are engaging in anonymous sex are exposing their sex partners to HIV, often without disclosing this risk to those sex partners. Intervention programmes need to target HIV-positive and HIV-negative men alike. For HIV-positive men engaging in anonymous sex, intervention messages need to address personal responsibility (e.g. Do you really want to run the risk of infecting another man with HIV? How would you feel if you found out that you personally were responsible for another man becoming HIV positive?) and offer tips on how to broach the subject of HIV serostatus within the sexual norms of anonymous sex encounters. Previous studies targeting HIV-positive MSM have found these men to be amenable to discussing their HIV serostatus with potential sex partners if they felt safe doing so, and had the necessary skills to initiate the discussion.[39–41] For HIV-negative men engaging in anonymous sex, intervention messages need to address personal safety (e.g. Are your personal health and your sexual safety worth the risk of having anonymous sex with people whose HIV serostatus is unknown to you?) and, again, offer tips on broaching the subject of HIV serostatus within the sexual norms of anonymous sex encounters.

Men who scored higher on the impulsivity scale were more likely to report recent involvement in anonymous sex than their less-impulsive peers. Previous studies have shown

a link between impulsivity and HIV risk-taking behaviours among MSM,[42,43] and the present study's finding is consistent with that body of research. It highlights a need to work with men who are impulsive and to help them to develop strategies that can reduce their willingness to act on impulse, particularly sexual impulses that may place them at risk for acquiring or transmitting HIV. The principles of a cognitive-behavioural therapeutic approach to intervention may be helpful here, as this approach can be quite effective at helping people to examine their behaviours, to understand their motivations to engage in particular behaviours, and to develop effective strategies to modify those behaviours in future situations. Other researchers[44] have also recommended the use of this therapeutic approach to reducing HIV risk, and some[45] have assessed and discussed its utility.

Finally, the author would like to address some of the findings obtained in the part of the analysis examining the factors differentiating greater and lesser involvement in anonymous sex among men who reported engaging in this behaviour during the previous month. First, the more that men reported using barebacking-focused MSM websites to meet sex partners, the fewer the number of reported recent anonymous sex encounters. However, this finding can be misleading; many MSM who meet other men online for sex do not consider these online-fostered sexual encounters to be anonymous because they have seen the other men's photographs online, exchanged (typically brief) email messages with these men, and/or chatted with these men (typically briefly) online prior to agreeing to meet for sex. In many (if not most) instances, men know little more about these Internet-found partners than they do about their purely anonymous sex partners, including such key information as sexual history, HIV serostatus and other sexually transmitted infection-related serostatus. However, there is an illusion of acquaintanceship, knowledge and familiarity with partners met online. Undoubtedly, Internet-fostered sexual encounters are likely to involve comparatively greater interaction and sexual-/safety-related discussion than anonymous sex encounters of other types. To the extent that this is true, the present study's finding of an inverse relationship between bareback website usage and the number of anonymous sex encounters is encouraging. However, it is important to remember that it is bareback website usage that is being considered here, implying by its very nature a willingness to engage in high-risk sex. This, of course, diminishes most of the 'protective' benefits of this practice's inverse relationship with men's anonymous sex activities.

Additionally, the multivariate analysis revealed that men who scored lower in condom use self-efficacy were more likely to report greater amounts of anonymous sex than their peers who scored higher in condom efficacy. This finding highlights the importance of working with MSM who engage in anonymous sex to bolster their confidence in their ability to broach the subject of condom use with their sex partners. It highlights the need to improve partner communication skills among members of this population, particularly during situations in which they are faced with high-risk sex (as would be the case in anonymous sex encounters). This finding also highlights the importance of working with MSM to improve their condom application skills and their strategies for making sure that they have access to condoms at all times when sexual involvement is possible. Having men consider the possibility of keeping a small safe sex kit (such as the type provided free of charge by organizations like DC Fukit; for more information about this organization, readers can go to www.dcfukit.org) with them, either on their person or in their vehicle, at all times would be

useful. Having men keep such safer sex materials in night stands beside their beds or in other places where they usually have sex would also be helpful in this regard. The important idea is to provide men with concrete strategies that they can use to make safer sex more possible more of the time.

Also worth noting is the fact that greater knowledge about HIV/AIDS and HIV transmission was related to lesser involvement anonymous sex among men who had engaged anonymous sex recently. Overall, HIV-related knowledge levels in this research sample are probably best characterized as ‘moderate’ – not ‘low’ and not ‘high’ overall. Substantial gaps in knowledge were identified. For example, 24.1% of the study participants did not know that, at this point in time, there is no cure for AIDS. Slightly more (26.8%) incorrectly thought that, at present, there is a vaccine that can prevent the spread of HIV. Approximately the same proportion of men (23.7%) thought that withdrawing the penis prior to internal ejaculation could not lead to HIV transmission. Nearly half of the men studied (44.4%) thought that performing oral sex on an HIV-positive man could not lead to the transmission of HIV. These findings and others from the present study indicate a need to provide more education to MSM about HIV risk practices. Realistically speaking, it is unlikely that enhancing HIV-related knowledge alone will lead to substantial reductions in anonymous sex practices among men in this population. However, any information that can be provided to help men to make better-informed decisions regarding their sexual health is a worthwhile endeavour.

In conclusion, this study found that both an interest in anonymous sex and actual involvement in this practice were commonplace among men using the Internet to find other men with whom they could engage in unprotected sex. Anonymous sex was found to be related closely to involvement in a variety of other HIV-related risk practices. A number of factors were identified as differentiating between men who had engaged in anonymous sex recently and those who had not engaged in anonymous sex recently. These included HIV serostatus, ability to answer all HIV/AIDS knowledge questions correctly, liking to have sex in public venues, and level of impulsivity. Additionally, among men engaging in anonymous sex, a number of factors were found to differentiate between those who reported minimal involvement in this practice and those who participated in it more frequently. These included relationship status, liking to have sex in public venues, using bareback-focused websites to meet sex partners, level of impulsivity, condom use self-efficacy, and amount of knowledge about HIV/AIDS.

Future research on the subject of anonymous sex among MSM could take many fruitful directions. First, additional work is needed to document the prevalence of anonymous sex among members of this population. It would be useful to know if different venues for anonymous sex – for example, in public parks vs public toilets vs gay bath houses vs adult book shops – were practised with greater/lesser frequency than others. Along this same line of enquiry, it would be useful for future researchers to document what types of sexual practices occur in these different anonymous sex venues. Are oral sex and anal sex practised with equal frequency in all of these anonymous sex venues, or do some venues tend to have greater rates of certain behaviours and lower rates of others? Future researchers examining anonymous sex among MSM might wish to avail themselves of qualitative research

methodologies to learn more about the benefits that men perceive themselves to derive from anonymous sex (i.e. what exactly it is that they like about this practice and what rewards they perceive themselves to derive from engaging in it when other, less-impersonal ways of having sex are also available), the perceived social and behavioural norms attendant to engaging in anonymous sex in various venues, and about men's perceptions of the risks associated with having anonymous sex. More work is also needed on the characteristics associated with engaging it in anonymous sex. Is it more common/popular among older or younger men (and why?)? Caucasian vs African American vs Latino men? HIV-positive vs HIV-negative men? Urban-dwellers vs suburban or rural residents? Well-educated or lesswell-educated men? Knowing which of these types of factors is/are associated with engaging in anonymous sex may be particularly important as this could lead to the development of targeted interventions for subpopulations of MSM who are more likely than others to engage in this practice.

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Table 1

–Multivariate model for determining whether or not men had engaged in anonymous sex during the preceding 30 days.

Independent variable	Odds ratio (95% CI)	β
HIV positive	2.20(1.31–3.69)	0.21 **
Answered all HIV/AIDS knowledge items correctly	4.94(1.51–16.17)	0.22 **
Amount of enjoyment of sex in public venues	1.17(1.09–1.26)	0.32 ***
Level of impulsivity	2.04(1.23–3.40)	0.20 **
Pseudo-R^2		0.190

HIV, human immunodeficiency virus; AIDS, acquired immunodeficiency syndrome; CI, confidence interval.

* $P<0.05$,

** $P<0.01$,

*** $P<0.001$.

Table 2–

Multivariate models for the number of times that sexually active men who had engaged in anonymous sex recently reported engaging in this behaviour.

Independent variable	Model 1 (β)	Model 2 (β)
Caucasian	—	−0.15 *
Relationship status: involved	0.17 *	0.17 *
Like to have sex in public venues (e.g. public toilets, parks, book shops)	0.21 **	0.22 **
Use bare back-oriented websites to identify partners specifically for unprotected sex	−0.19 *	−0.18 *
Level of impulsiveness	−0.23 **	−0.21 **
Level of condom use self-efficacy	−0.18 *	−0.17 *
Level of knowledge about HIV/AIDS	−0.21 **	−0.19 *
Experienced severe childhood maltreatment	0.15 *	—
R^2	0.236	0.236

HIV, human immunodeficiency virus; AIDS, acquired immunodeficiency syndrome.

* $P<0.05$,

** $P<0.01$.