Tip of the Iceberg: Young Men Who Have Sex With Men, the Internet, and HIV Risk

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Objectives. We examined the prevalence of Internet use for meeting sexual partners (Internet partners) and HIV risk behaviors associated with this use among young men who have sex with men (aged 16–24 years).

Methods. A sample of 270 young men who have sex with men completed a computer-assisted survey. We used bivariate χ^2 analyses and hierarchical logistic regression to assess factors associated with Internet-facilitated sexual encounters.

Results. Using the Internet to meet sexual partners was common; 48% of our sample had sexual relations with a partner they met online. Of these, only 53% used condoms consistently, and 47% reported having sexual partners older (>4 years) than themselves. Regression analyses showed increased age, White race/ethnicity, history of unprotected anal intercourse, multiple anal intercourse partners, and engaging in sexual activity at a sex club or a bathhouse were associated with meeting sexual partners through the Internet. Only history of unprotected anal intercourse was associated with risky sexual behaviors with Internet partners ($P<0.025$).

Conclusions. Young men who have sex with men and who seek partners online also engage in other behaviors that place them at risk for HIV and other sexually transmitted infections. (*Am J Public Health.* 2007;97:1113–1117. doi:10.2105/AJPH.2005.075630)

Adolescents and young adults are the largest segment of the US population with Internet access: an estimated 90% of youths aged 15 to 24 years have been online.[1] Today's youths have integrated the Internet into many aspects of their daily life, and they use it for everything from online shopping to accessing health-related information.[2] It has been suggested that lesbian, gay, bisexual, and transgender (LGBT) youths perceive the Internet to be a lifeline that affords them the ability to contact, communicate, and socialize with individuals who have had similar experiences but are often unavailable in the youths' day-to-day lives and communities.[3]

The Internet potentially holds special appeal for LGBT youths who are seeking romantic or sexual partners because its anonymity confers a sense of perceived safety against the stigma that surrounds same-sex activity.[3–5] Moreover, its expansive network offers access to a larger social group than is generally available within the context of a predominantly heterosexual culture. Among adult gay men, the Internet has emerged as a popular venue for seeking sexual partners and has been associated with high-risk behaviors that place individuals at risk for HIV and other sexually transmitted infections (STIs).[6–14] Several studies in the United States and Europe have found elevated levels of risky sexual behaviors among men who have sex with men (MSM) and who seek and meet sexual partners through the Internet (hereafter Internet partners). These studies were conducted with adult MSM, the majority of whom were aged 30 to 40 years.[6–14] Many previous studies have explored use of the Internet by adult MSM and sexual risk behaviors. These studies selectively sampled potentially high-risk participants, including men who were HIV positive, had been diagnosed with an STI, had attended a sex resort, had participated in gay pride festivities, or were recruited to participate in the studies while they were in bars and clubs.[6,9,12,14] By contrast, very little is known about Internet use and sexual risk behaviors among adolescent and young MSM, a population known to be at increased risk for acquiring HIV and other STIs.[15] Our exploratory study examined Internet use for meeting sexual partners and high-risk sexual and substance use behaviors among a sample of young MSM in Chicago, Ill.

METHODS

Participants and Procedures

A community-based sample of 270 ethnically diverse self-identified young MSM aged 16 to 24 years participated in our study. Youths were recruited consecutively during a 12-month period from August 2004 to September 2005 from multiple sources, including flyers posted in retail locations that were frequented by LGBT individuals (i.e., stores, coffee shops, restaurants), flyers posted in local agencies that served LGBT youths, advertisements posted on high school and college or university e-mail discussion lists, individual advertisements that were distributed in LGBT-identified neighborhoods, and snowball sampling. Trained staff assessed potential participants' decisional capacity for consent and reviewed study procedures and the risks and benefits of participation.[16] Surveys were administered in a private room at a community-based health center that provided primary care, STI and HIV specialty care, and social services to the LGBT community. Youths used self-administered computer-assisted technology to complete a 90-minute confidential survey that assessed sexual and substance use behaviors and Internet use for the purpose of meeting a romantic or sexual partner. Each participant received $30 for participating in the study.

Measures

Demographic measures included age, race/ethnicity, socioeconomic status, and sexual orientation. Participants reported their high-risk sexual activity (i.e., unprotected anal intercourse during the past 12 months and sexual activity with 2 or more anal intercourse partners during the past 3 months), substance use (e.g., methamphetamine, Ecstasy, Viagra) during the past 12 months, and whether they had ever been diagnosed with HIV or other STIs.

Additional questions inquired about lifetime sexual activity at a sex club or a bathhouse and commercial sexual activity, which was defined as sexual relations "in exchange for money or drugs." Five items assessed Internet use for seeking and meeting sexual partners. The first 2 items asked participants whether or not they had "ever used the Internet to try to find a romantic or sexual partner" or "ever had sex (anal or oral) with someone you met on the Internet." The third item used a 5-point scale, from never to always, to measure frequency of condom use with Internet partners. High-risk sexual activity was defined as anything other than 100% condom use during anal or oral sexual relations. Youths who reported high-risk sexual activity with Internet partners were asked to cite reasons for not using condoms. Finally, participants reported the age of their Internet partners as "a lot older (>4 years)," "slightly older (2–4 years)," "approximately the same age," or "younger."

Statistical Analyses

We generated frequencies of the demographic data, Internet items, and sexual and substance use behaviors for descriptive purposes. We used the Pearson χ^2 test statistic for bivariate analyses that assessed factors associated with 2 outcome variables: (1) having had sexual relations with an Internet partner (yes or no) and (2) having engaged in high-risk sexual activity (any sexual activity in which condoms were not used 100% of the time) with an Internet partner ($P<.05$). We used the entire study population (N=270) for analyses that examined factors associated with having sexual relations with an Internet partner, whereas only participants who reported having had sexual relations with an Internet partner (n=129) were used for analyses that examined correlates of high-risk Internet-facilitated sexual encounters. Because of the large number of variables that were significant in the bivariate analyses, we used hierarchical multiple regression to identify the most important predictors of each outcome variable after we adjusted for the effects of the other variables in the model. Correlations between independent variables were initially computed to screen for multicolinearity before inclusion in the regression analyses. The majority of correlations were less than 0.3, and the highest correlation was 0.41 (between HIV serostatus and history of STIs). To minimize the number of predictors in the regression models, we included only those significant predictors from the initial χ^2 tests in the regression analyses. Variables were entered in 2 steps, with demographic variables (race/ethnicity and age) and HIV serostatus entered in step 1, and sexual behavior and substance use entered in step 2. Race/ethnicity was dummy coded, with White as the reference group. We adjusted for multiple testing of our dependent variables using the Bonferroni correction; effects were considered significant if $P<.025$.

RESULTS

Table 1 shows the sample's demographic characteristics and risk behaviors. The young MSM ranged in age from 16 to 24 years (M=20.3, SD=2.3); 53% were younger than 21 years. Sixty-eight percent were non-White youths, and 70% characterized the home they "grew up in" as middle class. Participants endorsed a number of high-risk sexual and substance use behaviors: 24% had engaged in commercial sexual activities during their lifetimes, 28% had had sexual relations at a sex club or a bathhouse, 13% had used methamphetamine during the past year, 38% had engaged in either insertive or receptive unprotected anal intercourse during the past 12 months, 40% had had 2 or more anal intercourse partners during the past 3 months, and 13% were HIV positive.

A high number of young MSM (68%) reported Internet use for finding a romantic or sexual partner, and 48% reported having had sexual relations with someone they met using the Internet. Thirty-five percent of the young MSM younger than 21 years reported having had sexual relations with an Internet partner compared with 63% of participants who were aged 21 to 24 years, which was a significant difference ($\chi^2=21.08$; $P<.001$). White young MSM were most likely to meet sexual partners through the Internet (65%) compared with Black youths (20%) or Hispanic (51%) youths. Forty-seven percent of youths who had Internet-facilitated sexual encounters reported partners who were "a lot older (>4 years)" than themselves; an additional 25% reported partners who were "slightly older (2–4 years)." Of particular concern, only 53% of the young MSM reported 100% condom use during sexual encounters with Internet partners. Although our question about Internet partners did not allow us to differentiate between oral and anal sexual activities, of the 61 young MSM who reported inconsistent condom use with Internet partners, more than one third referenced anal intercourse specifically when they cited enjoying sexual activity more

TABLE 1—Demographics of the Young MSM Population (N = 270): Chicago, Ill; 2004–2005

Demographic Variable	No. (%)
Age, y	
16–17	33 (12)
18–20	111 (41)
21–24	126 (47)
Race/ethnicity	
White	86 (32)
Black	83 (31)
Hispanic/Latino	70 (26)
Asian/Pacific Islander	10 (4)
Other/multiracial	21 (8)
Socioeconomic status	
Upper class	31 (11)
Middle class	187 (70)
Lower class	51 (19)
Sexual orientation	
Gay/homosexual	226 (84)
Bisexual	40 (15)
Unsure/other	4 (1)
Sexual and substance use risk behaviors	
HIV positive	35 (13)
History of STIs	53 (20)
Commercial sexual activity	66 (24)
Sexual activity at sex club or bathhouse	75 (28)
Viagra use (past 12 mo)	19 (7)
Methamphetamine use (past 12 mo)	35 (13)
Marijuana use (past 12 mo)	138 (51)
Unprotected anal intercourse (past 12 mo)	103 (38)
Multiple anal intercourse partners (past 3 mo)	109 (40)
Tried to meet a romantic/sexual partner using Internet	184 (68)
Had sexual intercourse with Internet partner	129 (48)

Note. MSM = men who have sex with men, STI = sexually transmitted infection.

without a condom as the reason for their risky behavior ("it is more fun to play bare" or "anal sex feels better without condoms"). Other rationales for inconsistent condom use with Internet partners that were offered by 5% to 10% of our young MSM included carelessness ("I was stupid"), knowing a partner's HIV status ("we both knew our status"), inconvenience ("none around at the time"), vulnerability or partner pressures ("I was too afraid to ask"), and being high on drugs or alcohol ("I was too drunk to care").

Both outcome variables—sexual relations with Internet partners and unprotected sexual relations with Internet partners—were significantly associated with multiple demographic characteristics and sexual and substance use risk behaviors. According to χ^2 analyses, being younger than 21 years; being White; being HIV positive, having a history of an STI; having used methamphetamine, Viagra, or marijuana; having engaged in risky anal intercourse; having multiple anal intercourse partners; having engaged commercial sexual activity; and having engaged in sexual activity at a sex club or in a bathhouse were each associated with having had sexual relations with an Internet partner (all $P \leq .05$). By contrast, among young MSM who had had sexual relations with an Internet partner (n = 129), only commercial sexual activity, Viagra, methamphetamine use, and a history of unprotected anal intercourse were associated with unprotected Internet-facilitated sexual encounters (all $P \leq .05$). Unprotected sexual activity with an Internet partner was not associated with the age of online partners ($P = .25$), and socioeconomic status and sexual orientation were not significantly associated with either outcome variable.

Table 2 shows the results of hierarchical logistic regression analyses for both outcome variables. The first regression analysis showed that increased age, identification as White rather Black, history of risky anal intercourse, sexual activity at a sex club or a bathhouse, and multiple anal intercourse partners during the past 3 months were independent correlates of meeting Internet partners after we adjusted for the effects of other variables in the model (all $P \leq .025$). For example, when compared with their peers, young MSM who met a sexual partner online were almost 3 times as likely to also have had sexual relations at a sex club or a bathhouse, more than 3 times as likely to have had multiple anal intercourse partners during the past 3 months, and more than 2 times as likely to have had unprotected anal intercourse during the past 12 months. The model accounted for 48% of the variance in meeting sexual partners using the Internet. The second regression analysis was restricted to young MSM who reported meeting sexual partners on the Internet (n = 129). Again, unprotected anal intercourse during the past 12 months was significantly associated with risky anal or oral sexual intercourse with online partners; those who reported unprotected anal intercourse during the past year were more than 3 times as likely to have engaged in risky sexual relations with partners who were met online ($P < .025$). The model accounted for 25% of the variance in having sexual relations with partners who were met using the Internet.

TABLE 2—Hierarchical Multiple Regression Results for Meeting Sexual Partners Using the Internet and Having Unprotected Oral or Anal Sex With an Internet Partner

	Nagelkerke R^2	OR (95 % CI)	*P*
Met sexual partners using the Internet (n = 270)			
Step 1	.32		
Age		1.30 (1.12, 1.51)	.001
Black[a]		0.11 (0.04, 0.29)	<.001
Hispanic/Latino[a]		0.50 (0.34, 1.68)	.498
Other race/ethnicity[a]		1.01 (0.34, 3.00)	.977
HIV positive		1.70 (0.57, 5.08)	.340
Step 2	.48		
History of STIs		1.14 (0.42, 8.53)	.785
Commercial sexual activity		1.35 (0.59, 3.07)	.474
Marijuana use (past 12 mo)		1.11 (0.58, 2.12)	.758
Viagra use (past 12 mo)		0.39 (0.88, 3.07)	.210
Methamphetamine use (past 12 mo)		1.13 (0.38, 3.35)	.821
Multiple anal intercourse partners (past 3 mo)		3.59 (1.72, 7.46)	.001
Unprotected anal intercourse (past 12 mo)		2.20 (1.11, 4.37)	.024
Sexual activity at sex club or bathhouse		2.88 (1.21, 6.82)	.016
Had unprotected oral or anal sex with internet partner (n = 129)			
Step 1	.01		
Age		0.99 (0.81, 1.22)	.991
Black[a]		0.58 (0.16, 2.11)	.411
Hispanic/Latino[a]		0.87 (0.32, 2.34)	.782
Other race/ethnicity[a]		0.71 (0.22, 2.26)	.562
HIV positive		0.81 (0.28, 2.38)	.699
Step 2	.25		
Commercial sexual activity		2.34 (0.93, 5.87)	.072
Methamphetamine use		2.24 (0.77, 6.55)	.141
Viagra use		1.84 (0.39, 8.64)	.437
Unprotected anal intercourse (past 12 mo)		3.42 (1.55, 7.57)	.002

Note. OR = odds ratio, CI = confidence interval, STI = sexually transmitted infection.
[a]White race/ethnicity was the reference category.

DISCUSSION

Consistent with the emerging literature about adult MSM, our results show that many adolescent and young adult MSM use the Internet for both seeking and meeting sexual partners. Sixty-eight percent of the young MSM aged 16 to 24 years reported having used the Internet in an attempt to meet a romantic or sexual partner, and 70% (129 of 184) of those participants reported having had sexual relations with an Internet partner.

Although initiating sexual contact through the Internet is certainly not a new phenomenon, our data are among the first to identify the Internet as an important venue for forming sexual networks among young MSM, an understudied subpopulation of youths at risk for acquiring HIV and other STIs.[15] For youths who identifiy as gay, lesbian, or bisexual, navigating an adolescence and young adulthood complicated by the stigma that surrounds a nonheterosexual identity, the relative anonymity of the Internet may facilitate same-sex sexual experimentation that may not be available in more traditional social venues.[3–5] White and Hispanic young MSM in our sample were more likely than young Black MSM to either seek or meet a sexual partner online, which may suggest that there are racial/ethnic populations of youths who have either greater access to computers or greater access to confidential use of the Internet, because locating sexual partners requires both access to computers and an environment conducive to discreet online interaction. Similar rationale may help explain the age differences in seeking and meeting sexual partners online among our study population.

The young MSM in our study reported numerous risk behaviors both online and offline. However, when compared with their peers, the young MSM participants who used the Internet to meet sexual partners reported statistically higher rates of risky sexual behavior across the board (i.e., increased number of sexual partners, less consistent condom use during anal intercourse, history of commercial sexual activity, and sexual activity at a sex club or a bathhouse) and greater use of Viagra and methamphetamine, substances that are well-known to either facilitate sexual activity or be associated with risky sexual behavior.[17] As such, our study extends the current literature on contextual factors associated with Internet-facilitated sexual encounters among adult MSM and young MSM. Contextual factors, including methamphetamine or Viagra use, commercial sexual activity, and sexual activity at a sex club or a bathhouse, are of particular concern because of their clear association with HIV risk among adult MSM.[14–17] Moreover, having sexual relations at a sex club or a bathhouse, which remained an independent predictor of meeting sexual partners online in our multivariate analyses, may point to a subpopulation of young MSM who are enticed by the relative ease of anonymous sexual activity that both venues offer. The high rate of youths (>50%) who met older Internet partners potentially accentuates the risks for these young men. In addition, the association between risky sexual behaviors (i.e., either multiple anal intercourse partners in the past 3 months or history of unprotected anal or oral intercourse in the past year) and meeting Internet partners, and the association between unprotected anal intercourse and risky Internet-facilitated sexual encounters, after we controlled for the effect of other variables in our hierarchical models, suggests an association between general sexual risk behaviors among young MSM and the Internet that needs to be further explored.

Despite the growing body of evidence that associates Internet-facilitated sexual encounters with risky sexual behaviors among MSM, which now includes young MSM, the underlying motivations remain poorly understood for the adolescent and young adult subpopulation. In an exploratory attempt to understand the motivations that underlie risky sexual behaviors with Internet partners, we asked participants to tell us why they did not use condoms during Internet-facilitated sexual encounters. They reported partner pressures or vulnerability, inconvenience, decreased enjoyment, and carelessness, which underscores the importance of future research that identifies risk mechanisms, particularly within the context of adolescent development and an emerging young MSM identity. However, because our study is among the first reports of Internet use among young MSM, many questions remain unanswered. For example, is the Internet an independent source of risk, simply a tool for taking risks, or both?

Because of the extent to which the Internet has permeated youth culture, and because of concerns about heightened HIV and STI risk among young MSM, our findings illuminate both the challenges of the Internet and the opportunities that the Internet provides. The challenge posed by the Internet for STI and HIV prevention is the relative ease with which the Internet can facilitate anonymous and potentially risky sexual encounters that are otherwise unavailable in traditional social settings. The Internet holds tremendous appeal as a social and sexual networking tool, particularly among young MSM who are in environments where there are limited options for the exploration of their sexual identity.[3–5] The opportunity is the Internet's potential to connect with an often hard-to-reach and vulnerable population that is not easily accessed through clinical and community-based settings.[21] Some Internet-based HIV/STI prevention interventions have been developed and piloted for adult MSM. For example, some programs encourage or facilitate safer-sex discussions in private e-mail conversations and chat rooms, and other programs post prevention messages on MSM-oriented Web sites.[18–20] However, it remains unclear how to identify, recruit, and retain participants in Internet-based HIV/STI prevention interventions. It also is unclear whether these interventions will ultimately prove effective in changing behavior.[20,21] The promise of interventions for young MSM will rely to a great extent on their ability to be tailored to the developmental needs of youths, including a focus on developing sexual health communication and self-efficacy skills and being able to resist a sexual partner's pressure to engage in risky behaviors.

Limitations

Study limitations warrant cautious interpretation of our findings. First, the data we collected are cross-sectional; therefore, we cannot draw conclusions about causality. For example, we cannot determine if access to the Internet leads to engagement in high-risk behaviors or if young MSM who generally engage in high-risk behaviors use the Internet as another tool for doing so. However, a study of adult MSM found non–HIV-positive gay men were no more likely to meet high-risk sexual partners online rather than offline.[9] Second, sexual behaviors and substance use were measured by self-report and may have been subjected to social desirability (underreporting or overreporting risk behaviors). Empirical evidence suggests that self-reports of sensitive data that are collected using computer-assisted techniques, as was done in our study, reduce bias and increase validity.[22,23] Third, participants were recruited from 1 urban geographic area, where substance use and sexual activity may have been more prevalent; thus, our findings may not be generalizeable to nonurban

settings. Likewise, the survey was administered at a LGBT-specific community-based site that offered HIV and STI specialty services in addition to primary care and social support services. As such, our findings may not be generalizeable to samples of young MSM who would not enter this setting. Finally, the survey items regarding Internet use for seeking and meeting sexual partners were designed specifically for this study and were not previously validated. The questions did not allow us to either quantify the number of sexual partners who were met online or to differentiate between the oral and anal sexual activities of participants with online partners. Nevertheless, our study is among the first to document considerable Internet use by young MSM who want to meet sexual partners, and these data provide a critical examination of Internet-related high-risk sexual and substance use behaviors among a very young, ethnically diverse, and urban community-based sample of young MSM—an adolescent and young adult group about which relatively little is known.

Conclusions

Similar to adult MSM, adolescent and young adult MSM use the Internet to seek and meet sexual partners. They also engage in a variety of behaviors that place them at great risk for acquiring HIV and other STIs from their Internet partners. Because the Internet continues to play an important role in the socialization patterns and sexual networks of young MSM, additional research about the risk factors associated with meeting sexual partners online and the context in which high-risk sexual and substance use behaviors occur with Internet partners is needed. Such research will provide important information for the development of specially tailored HIV prevention interventions for young MSM. These interventions will need to be sensitive to the unique developmental, privacy, and confidentiality concerns of young MSM while simultaneously emphasizing the benefits of condom use, regular screening for HIV and STIs, and safer-sex negotiation skills. ■

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Contributors

R. Garofalo planned the study, directed the project, participated in the data analysis, and wrote the article. A. Herrick was the study coordinator and supervised the administration of the survey. B.S. Mustanski conducted the majority of the data analysis. G.R. Donenberg supervised coordination of the project and data analysis. All authors participated in the preparation of the article.

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Human Participants Protection:

The institutional review boards of Children's Memorial Hospital and the Howard Brown Health Center approved all study procedures before data collection.

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