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## Sexting Among Young Men Who Have Sex With Men: Results From a National Survey

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### A B S T R A C T

**Purpose:** We know little about the prevalence of sexting behavior among young men who have sex with men (YMSM) or its association with their sexual behaviors.

**Methods:** To address these gaps, we used data from an online study examining the partner-seeking behaviors of single YMSM (N = 1,502; ages 18–24 years) in the United States. Most participants (87.5%) reported sexting, with 75.7% of the sample reporting having sent and received a sext.

**Results:** Sexting was more frequent among sexually active YMSM, with YMSM who had sent and received a sext being more likely to report insertive anal intercourse, with and without condoms, than those who had not sexted. We found no association between sexting and receptive anal intercourse.

**Conclusions:** Our findings suggest that sexting may vary by YMSM's sexual roles. We discuss our findings with attention to their implications for sexual health promotion.

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### IMPLICATIONS AND CONTRIBUTION

In light of recent divergent findings, we investigated sexting behavior among young men who have sex with men (YMSM) in the United States. Our findings provide evidence that sexting is prevalent among YMSM; however, limited support links sexting to sexual risk.

Sexting is a term combining the words “sex and texting” and describes sending sexually suggestive photos or messages through text messages. As a form of sexual communication in the era of mobile technologies, sexting may be used between two people as a means of flirting [1]. Increasingly, researchers have noted a growing prevalence in lifetime sexting behavior among adolescents [2–5] and young adults [6,7]. Given ongoing discussions regarding the legality of sexting in this age group and its potential psychosocial implications [8], researchers have sought to examine whether sexting is associated with risk-taking behaviors (e.g., unprotected sex) in order to develop tailored risk reduction strategies and sexual health education messages.

Given prior evidence noting an increased clustering in risk behaviors for HIV/STI and online partner-seeking [9–11], sexting

research to date has sought to examine whether individuals who sext also exhibit similar risk clustering patterns. Across studies, researchers have noted divergent findings regarding the association between sexting and sexual risk behaviors for adolescents and young adults. In studies with adolescents, for example, Temple et al. [2] found that having sent a sext message was more likely among adolescents who had prior dating experience and had sex. When stratified by gender, however, the researchers only noted an association between sending a sext and sexual risk behaviors (e.g., multiple partners and substance use with sex) among females in the sample. As part of the Youth Risk Behavior Survey of Los Angeles, Rice et al. [3] found that youth who had ever sent a sext were more likely to have previously engaged in sexual activity; a positive trend was also found with unprotected sex at last intercourse. In their sample, Rice and colleagues noted no gender differences in sexting history; however, they did note that individuals identifying as sexual minorities (e.g., lesbian, gay, bisexual, or transgender [LGBT]) were more likely to have engaged in sexting behavior than heterosexual counterparts.

**Conflict of Interest:** The authors have no conflicts of interest to declare.

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Taken together, the diverse findings between sexting and sexual risk across studies may be attributable to the populations studied and their sociodemographic characteristics (e.g., gender, relationship status, sexual orientation). Given the noted differences by gender and sexual identity in these studies, we sought to extend this work by examining the prevalence of sexting among young men who have sex with men (YMSM), who may or not identify as gay.

In studies with young adults, Benotsch and colleagues [6] found that participants were three times more likely to report having had multiple partners and having engaged in unprotected sex in the past 3 months if they had engaged in sexting behavior. The Temple et al. [2], Rice et al. [3], and Benotsch et al. [6] studies did not examine whether youth who received sexts were as likely to report sexual activity and/or sexual risk behaviors as those who sent sexts. Some evidence by Gordon-Messer et al. [7] suggests that whether youth send and/or receive sexts may be associated with different sexual risk outcomes. In their study, Gordon-Messer et al. found that sexually active respondents were more likely to have sent and received a sext as compared with non-sexually active participants; however, they found no relationship between sexting and the number of unprotected sexual partners in the past 30 days within their sexually active sample. Furthermore, they found limited evidence to suggest an association between sexual risk outcomes and having only sent or received sexts. Given the absence of a theoretical basis to suggest that sending a sext is more likely to be associated with sexual activity than receiving a sext, as part of our study we sought to examine whether sexting (whether sent and/or received) was associated differentially with recent sexual risk outcomes.

#### Study goals and objectives

In light of these divergent findings, a recent editorial by Levine [1] pointed out that we must carefully examine our assumptions regarding sexting as a risk marker, and understand that the relationship between sexting and risk behaviors may depend on sample characteristics and their likelihood to engage in high-risk sexual practices. Consequently, we employ an epidemiologic framework to identify the prevalence of sexting behavior among YMSM in the United States and its potential association with sexual risk outcomes. Cognizant of sociodemographic differences in prior studies (e.g., gender, sexual orientation, relationship status), we examined the prevalence of sexting behavior in a national sample of single YMSM in the United States and tested its association to their sexual risk behaviors.

## Methods

### Sample

Data for this paper come from a cross-sectional observational study examining single YMSM's partner-seeking experiences online between July 2012 and January 2013. To be eligible for participation, recruits had to self-identify as male, be between the ages of 18 and 24 years, report being single and attracted to other men, and be a resident of the United States (including Puerto Rico). Participants were recruited through advertisements (N = 1,335; 88.6%) on two popular social networking sites, peer referrals (N = 142; 9.5%), or by study staff (N = 29; 1.9%). Social

network advertisements were viewable only to men who fit our age range and who lived in the United States. Promotional materials displayed a synopsis of eligibility criteria, a mention of a \$10 VISA e-card incentive, and the survey's Web site.

Using best practices [12], we identified 1,963 valid entries. Of these, 325 participants consented but did not commence the survey (i.e., missing all data; 16.6%); resulting in an analytic sample of N = 1,638 eligible YMSM. One hundred and ninety-three of these eligible and consented participants did not complete all sections of the survey (i.e., missing data in some sections of the survey; 10.5%). For those questionnaires that were incomplete, participants were sent two reminder e-mail messages that encouraged them to complete the questionnaire; one e-mail message was sent a week after participants had started the questionnaire and another was sent a week before the questionnaire was scheduled to close. For the purposes of this analysis, we report on the subsample that provided full study data (N = 1,502; 76.5% participation rate). We provide a brief description of the sample's characteristics in Table 1.

**Table 1**  
Descriptive statistics for study participants (N = 1,502)

	Mean (SD)/N (%)
Age	20.80 (1.93)
Race/ethnicity	
White	986 (65.6)
Black	130 (8.7)
Latino	253 (16.8)
Asian/Pacific Islander	58 (3.9)
Multiracial	54 (3.6)
Other	21 (1.4)
Sexual identity	
Gay	1,386 (92.3)
Bisexual	48 (3.2)
Straight/heterosexual	27 (1.8)
Same-gender loving	13 (.9)
Men who have sex with men	3 (.2)
Other	25 (1.7)
Educational attainment	
Less than high school degree	54 (3.6)
High school diploma/General Educational Development test	314 (20.9)
Technical/associate degree	89 (6.0)
Some college	732 (48.7)
College degree	220 (14.6)
Some graduate school	80 (5.3)
Graduate school	13 (.9)
Region	
Northeast	283 (18.8)
Midwest	394 (26.1)
South	420 (27.9)
West	392 (26.0)
Puerto Rico	12 (.8)
Internet use per day outside of school/work responsibilities	4.10 (1.40)
Ever sent or received sext	1,315 (87.5)
Sexting status	
Neither sent nor received	187 (12.5)
Sent-only	20 (1.3)
Received-only	158 (10.5)
Sent and received	1,137 (75.7)
Sexual behaviors (prior 2 months)	
Sexually active	1,058 (70.4)
Receptive anal intercourse	715 (47.7)
Unprotected receptive anal intercourse	425 (28.3)
Insertive anal intercourse	598 (39.8)
Unprotected insertive anal intercourse	361 (24.1)

## Procedures

Consented participants answered a 30–45-minute online questionnaire that covered assessments regarding their socio-demographic characteristics, Internet use, ideal relationship and partner characteristics, sexual behaviors, psychological well-being, and sexting behaviors. Data were protected with a 128-bit SSL encryption and kept within a University of Michigan firewalled server. We acquired a Certificate of Confidentiality from the National Institutes of Health to protect study data. The University of Michigan institutional review board approved all study procedures.

## Measures

**Sociodemographic characteristics.** Respondents were asked to report their age (in years) and highest level of education completed (1 = eighth grade or less; 2 = Some high school; 3 = High school/General Educational Development test (GED); 4 = Technical school; 5 = Associate degree; 6 = Some college; 7 = College degree; 8 = Some graduate school; 9 = Graduate school degree). YMSM were asked to self-report their sexual identity (“How do you self-identify?”) and asked to check all the responses that applied: 1 = Gay/homosexual; 2 = Bisexual; 3 = Straight/heterosexual; 4 = Same-gender loving; 5 = Men who have sex with men; 6 = Other (participants in the other category self-identified as queer, fluid, polyamorous, pansexual, demisexual, and asexual). A subsequent question asked them to indicate the identity that most closely fit with how they self-identify. Given the majority of participants self-identified as gay, we dichotomized the sexual identity variable into gay or other sexual identity. State of residence was ascertained and then collapsed into the four census regions in the United States.

Respondents were also asked to report their race/ethnicity by checking all that applied: White or European-American, African-American or black, Asian or Pacific Islander, Middle Eastern, Native American, and Other. Participants who reported two or more race categories, or who wrote “biracial” or “mixed” in the Other category, were identified as Multiracial. Subsequently, participants were asked if they were Hispanic/Latino. We combined the Middle Eastern, Native American, and Other race categories given the limited number of observations. We created dummy variables for each race/ethnicity group. White participants served as the referent group in our analyses (see Table 1).

**Internet use.** Participants reported how many hours per day on average they spent on the Internet for personal use outside of work and school responsibilities using an 8-point scale (1 = No hours; 2 = Less than an hour; 3 = 1 to 3 hours; 4 = 4 to 6 hours; 5 = 7 to 9 hours; 6 = 10 to 12 hours; 7 = 13 to 15 hours; 8 = 16 hours or more).

**Sexting behaviors.** In order to ascertain sexting behaviors, participants were asked to report the number of times they had sexted in their lifetime. We defined sexting based on the Pew Internet and American Life Project, specifically as the transmittance of a sexually suggestive nude or nearly nude photo or video of either party (sending vs. receiving) via cell phones [13].

Given that the different set of findings linking sexting and sexual risk behaviors may be attributable to how sexting is operationalized across studies, we created two different sexting variables. Consistent with prior studies [2,3,6], we created a dichotomous lifetime sexting variable (i.e., never/ever sent or

received a sext). Although fruitful in helping identify a relationship between sexting and sexual risk behaviors, this measurement approach fails to elucidate whether sending and/or receiving a sext results in different health outcomes. Consequently, in an effort to determine whether different patterns are linked to sexual risk practices, we also created a sexting variable that considered whether sending and/or receiving sexts is differentially associated with sexual risk by proposing four sexting categories. Using Gordon-Messer et al.’s [7] approach, we then also created a categorical sexting variable: Non-sexters (NS); Senders-only (SO); Receivers-only (RO); and Two-way sexters (TW).

**Sexual behaviors.** Respondents were asked to report their sexual behavior (i.e., defined in the survey as oral, anal, and vaginal sex) with men and women in the previous 2 months using a previously validated assessment for YMSM [14]. In Table 1, we report the proportion of participants who reported being sexually active, as defined by having had at least one male sexual partner in the past 2 months, and whether or not they had engaged in receptive anal intercourse (RAI), unprotected RAI (URAI), insertive anal intercourse (IAI), and unprotected IAI (UIAI) with one or more male partners over the same 2-month period.

## Data analytic approach

We first examined the study variables using descriptive statistics (see Table 1). Subsequently, we conducted bivariate analyses to examine the association between sexting and the other study variables using *Chi-square* tests for categorical variables and *t-test* and analysis of variance (ANOVA) tests for ordinal variables. For our ANOVA tests, we conducted Scheffé post-hoc tests to examine mean differences across sexting groups. Finally, we conducted multivariate logistic regressions to examine the association between sexual behaviors and sexting, using the binary (yes/no; Table 2) and categorical (4 sexting groups; Table 3) operationalizations of sexting. We accounted for age, race/ethnicity, sexual identity, and education in our regression analyses as sociodemographic covariates. We restricted the multivariate analyses focused on recent sexual behavior (e.g., RAI, URAI, IAI, UIAI) to participants who reported being sexually active in the prior 2 months. This strategy allowed us to avoid misestimating our models due to the confounding of who is accounted for in our outcomes’ referent group (i.e., including both participants who were not sexually active and those who did have sex but did not engage in sexual risk behaviors).

## Results

### Sexting behaviors

Over 80% of our analytic sample ( $N = 1,316$ ; 87.4%) had engaged in some sort of sexting behavior. Non-sexters were slightly younger ( $M = 20.40$ ) than sexters ( $M = 20.86$ ) ( $t_{(1,500)} = -3.06$ ;  $p = .002$ ). Sexters ( $M = 5.48$ ) reported greater educational attainment than non-sexters ( $M = 5.14$ ;  $t_{(1,500)} = -2.63$ ;  $p = .009$ ). Gay men were more likely to report sexting (88.3%) compared with non-gay identified men (78.4%;  $\chi^2_{(1)} = 9.55$ ;  $p = .002$ ). YMSM in the Northeast region of the United States (18.3%) were least likely to engage in sexting behaviors ( $\chi^2_{(3)} = 16.31$ ;  $p = .001$ ), as compared with men living in the West (26.8%), Midwest (25.3%), and South (29.6%) regions of the United States. We noted no differences between sexters and non-sexters by race/ethnicity ( $\chi^2_{(5)} = 7.01$ ;

**Table 2**  
Multivariate logistic regression examining the relationship between lifetime sexting and recent sexual behaviors of YMSM

	Sexually active (N = 1,502)		RAI (N = 1,058)		URAI (N = 1,058)		IAI (N = 1,058)		UIAI (N = 1,058)	
	OR (95% CI)	Sig.	OR (95% CI)	Sig.	OR (95% CI)	Sig.	OR (95% CI)	Sig.	OR (95% CI)	Sig.
Gay <sup>a</sup>	1.88 (1.24, 2.84)	.003	.92 (.52, 1.62)	.771	.74 (.44, 1.25)	.261	.43 (.24, .79)	.006	.64 (.38, 1.09)	.098
Sent or received sext (yes/no) <sup>b</sup>	4.88 (3.52, 6.77)	.001	1.30 (.77, 2.18)	.332	1.42 (.84, 2.41)	.197	2.01 (1.26, 3.50)	.005	1.89 (1.06, 3.38)	.032
Race/ethnicity <sup>c</sup>										
Black	1.17 (.64, 2.12)	.616	1.15 (.58, 2.27)	.683	1.50 (.74, 3.04)	.262	2.15 (1.09, 4.25)	.028	2.84 (1.17, 6.91)	.021
Latino	1.75 (.85, 3.61)	.131	1.58 (.71, 3.52)	.266	.87 (.38, 1.98)	.743	4.15 (1.86, 9.29)	.001	2.75 (1.04, 7.30)	.042
Asian/Pacific Islander	1.13 (.59, 2.16)	.704	1.81 (.86, 3.81)	.118	1.83 (.86, 3.88)	.115	2.51 (1.21, 5.22)	.013	3.17 (1.25, 8.01)	.015
Multiracial	.98 (.43, 2.23)	.953	1.06 (.40, 2.79)	.905	1.64 (.62, 4.33)	.318	3.39 (1.28, 8.97)	.014	3.44 (1.12, 10.52)	.030
Other	.61 (.21, 1.77)	.359	.60 (.16, 2.23)	.444	.21 (.02, 1.83)	.157	3.64 (.91, 14.59)	.068	2.80 (.63, 12.48)	.177
Education	1.03 (.95, 1.12)	.432	1.01 (.92, 1.10)	.888	.87 (.80, .95)	.002	.94 (.86, 1.03)	.170	.92 (.84, 1)	.052
Age	1.09 (1.02, 1.17)	.011	.97 (.90, 1.05)	.421	1.03 (.96, 1.10)	.466	1.09 (1.01, 1.17)	.019	1.08 (1.01, 1.17)	.035
Constant	.04	.001	2.64	.270	.55	.482	.14	.023	.05	.001

IAI = insertive anal intercourse; RAI = receptive anal intercourse; UIAI = unprotected insertive anal intercourse; URAI = unprotected receptive anal intercourse; YMSM = young men who have sex with men.

<sup>a</sup> Non-gay identified men serve as referent group.

<sup>b</sup> Non-sexsters serve as referent group.

<sup>c</sup> White men serve as referent group.

$p = .220$ ) nor in the number of hours spent online ( $t_{(1,500)} = -1.52$ ;  $p = .128$ ).

Among sexters, 20 participants (1.3%) reported SO; 158 (10.5%) RO; and 1,137 (75.7%) reported TW sexting. Non-sexsters were slightly younger ( $M = 20.40$ ) than TW sexters ( $M = 20.82$ ) and RO ( $M = 21.13$ ) sexters ( $F_{(3, 1,501)} = 4.32$ ;  $p = .005$ ). Gay identified participants were more likely to be represented in TW (93.4%) or RO (92.4%) categories than in the SO (80.0%) or NS (86.6%) categories ( $\chi^2_{(3)} = 14.62$ ;  $p = .002$ ). We noted no differences across sexting categories by educational attainment ( $F_{(3, 1,501)} = 2.31$ ;  $p = .075$ ), race/ethnicity ( $\chi^2_{(15)} = 17.58$ ;  $p = .285$ ), or in the number of hours spent online ( $F_{(3, 1,501)} = .78$ ;  $p = .504$ ).

**Sexual behaviors and sexting**

Over 70% of participants reported sexual activity in the prior 2 months. Nearly half of participants engaged in RAI (N = 715; 47.7%), with over a quarter reporting engagement in unprotected

RAI (N = 425; 28.3%). Nearly 40% of participants engaged in IAI (N = 598; 39.8%), with nearly a quarter of participants reporting unprotected IAI (N = 361; 24.1%).

In multivariate analyses examining sexting likelihood (Table 2), sexters were more likely to have been recently sexually active than non-sexsters (OR = 4.88 [95% CI: 3.52, 6.77];  $p \leq .001$ ), after accounting for sexual identity, race/ethnicity, age, and education. Among sexually active participants, sexters were more likely than non-sexsters to report having had insertive anal sex (OR = 2.01 [95% CI: 1.26, 3.50];  $p = .005$ ), and unprotected insertive anal intercourse in the prior 2 months (OR = 1.89 [95% CI: 1.06, 3.38];  $p = .032$ ), after accounting for sexual identity, race/ethnicity, age, and education. We found no other relationship between sexting and RAI (OR = 1.30 [95% CI: .77, 2.18];  $p = .332$ ) or URAI (OR = 1.42 [95% CI: .84, 2.41];  $p = .197$ ).

When we compared sexual behaviors across sexting groups (Table 3), TW (OR = 5.79 [95% CI: 4.15, 8.08];  $p \leq .001$ ) and RO (OR = 2.07 [95% CI: 1.33, 3.21];  $p \leq .001$ ) sexters were more likely

**Table 3**  
Multivariate logistic regression examining the relationship between sexting categories and recent sexual behaviors of YMSM

	Sexually active (N = 1,502)		RAI (N = 1,058)		URAI (N = 1,058)		IAI (N = 1,058)		UIAI (N = 1,058)	
	OR (95% CI)	Sig.	OR (95% CI)	Sig.	OR (95% CI)	Sig.	OR (95% CI)	Sig.	OR (95% CI)	Sig.
Gay <sup>a</sup>	1.82 (1.91, 2.78)	.006	.92 (.52, 1.62)	.772	.74 (.44, 1.25)	.253	.42 (.22, .77)	.005	.64 (.38, 1.07)	.090
Sexting <sup>b</sup>										
Two-way	5.79 (4.15, 8.08)	.001	1.30 (.77, 2.18)	.327	1.42 (.83, 2.41)	.197	2.15 (1.29, 3.60)	.003	1.94 (1.08, 3.47)	.027
Received	2.07 (1.33, 3.21)	.001	1.32 (.68, 2.60)	.414	1.45 (.74, 2.83)	.280	1.75 (.91, 3.36)	.093	1.54 (.74, 3.19)	.248
Sent	1.72 (.67, 4.39)	.258	1.30 (.30, 5.56)	.722	1.22 (.31, 4.81)	.780	1.17 (.30, 4.65)	.819	1.26 (.29, 5.52)	.761
Race <sup>c</sup>										
Black	1.06 (.58, 1.93)	.852	1.15 (.58, 2.28)	.679	1.50 (.74, 3.05)	.259	2.12 (1.07, 4.21)	.031	2.80 (1.15, 6.82)	.024
Latino	1.55 (.74, 3.22)	.244	1.58 (.71, 3.54)	.265	.88 (.39, 1.99)	.750	4.07 (1.81, 9.13)	.001	2.69 (1.01, 7.15)	.047
Asian/Pacific Islander	1.02 (.53, 1.97)	.942	1.81 (.86, 3.82)	.118	1.84 (.87, 3.91)	.113	2.49 (1.19, 5.17)	.015	3.12 (1.23, 7.91)	.016
Multiracial	.88 (.38, 2.04)	.772	1.06 (.40, 2.79)	.903	1.64 (.62, 4.34)	.317	3.35 (1.27, 8.87)	.015	3.41 (1.11, 10.42)	.032
Other	.55 (.19, 1.63)	.285	.60 (.16, 2.79)	.446	.21 (.02, 1.83)	.158	3.58 (.89, 14.35)	.072	2.75 (.62, 12.26)	.185
Education	1.03 (.95, 1.11)	.538	1.01 (.92, 1.10)	.887	.87 (.80, .95)	.002	.94 (.86, 1.03)	.167	.92 (.84, 1)	.051
Age	1.11 (1.03, 1.19)	.004	.97 (.90, 1.05)	.419	1.03 (.96, 1.10)	.467	1.09 (1.02, 1.18)	.016	1.09 (1.01, 1.17)	.031
Constant	.04	.001	2.64	.270	.55	.484	.14	.022	.05	.001

IAI = insertive anal intercourse; RAI = receptive anal intercourse; UIAI = unprotected insertive anal intercourse; URAI = unprotected receptive anal intercourse; YMSM = young men who have sex with men.

<sup>a</sup> Non-gay identified men serve as referent group.

<sup>b</sup> Non-sexsters serve as referent group.

<sup>c</sup> White men serve as referent group.



to be sexually active than non-sexsters, after accounting for sexual identity, race/ethnicity, age, and education. Among sexually active participants, TW sexters were more likely than non-sexter counterparts to report having insertive anal intercourse (OR = 2.15 [95% CI: 1.29, 3.60];  $p = .003$ ) and unprotected insertive anal intercourse (OR = 1.94 [95% CI: 1.08, 3.47];  $p = .038$ ). We found no association between sexting and RAI or URAI.

## Discussion

Researchers have noted that if lifetime sexting is an indicator of sexual risk, it may be useful to identify populations that may benefit from tailored risk reduction strategies and sexual health education messages [3]. At present, however, the relationship between sexting and sexual risk among young adults remains mixed, perhaps due to the diversity in sample characteristics in prior studies [6,7] and the way that sexting has been operationalized. We sought to build on this ongoing work by examining the relationship between sexting and sexual risk behaviors among YMSM, using two different operationalizations of lifetime sexting (any sexting vs. sexting categories).

Compared with prior studies with heterosexual samples [2,6], we found YMSM reported a higher prevalence of lifetime sexting—the majority of whom reported reciprocal sexting (i.e., both sending and receiving sexts). The higher sexting prevalence may be attributable to YMSM's greater comfort in sharing suggestive texts or pictures with prospective partners through online technologies. Prior research, for example, has documented how YMSM use online technologies to explore their sexuality and meet partners [15,16]. In these online exchanges, YMSM may be more likely to participate in sexually charged conversations and include suggestive pictures in their online profiles [17]. Furthermore, the recent development of mobile-based geospatial partner-seeking applications (e.g., Grindr) has further facilitated YMSM's exchange of suggestive messages or pictures with potential partners through mobile technologies and been linked to increased sexual risk practices [18,19]. Given the definition currently employed to define "sexting" (i.e., sharing suggestive photos or messages through text messages), it is possible that our high prevalence may be accounted for by both sexting through text messages as well as through chatting in geospatial smart-phone applications. Future research examining whether YMSM express similar motivations and comfort when they sext via text message and/or geospatial smart-phone applications is warranted.

Consistent with prior studies [6,7], we found sexting was more likely among YMSM who reported being sexually active in the prior 2 months. This association was noted, regardless of whether we used the dichotomous or categorical sexting variable. When we examined the sexual risk behaviors among the sexually active subsample, however, we found that the relationship between sexting and sexual risk behaviors varied by sexual role (i.e., insertive vs. receptive) and by the reciprocity in sexting (e.g., two-way sexting). Although we found no relationship between sexting and receptive anal intercourse behaviors, YMSM who reported sexting were more likely to report insertive anal sex, both with and without condoms. When divided into sexting categories, we found that two-way senders were more likely than non-sexsters to report having engaged in insertive anal intercourse behaviors, but these outcomes were not noted among sexters in the SO or RO categories. Although the absence of these findings in the SO or RO categories may be attributable to smaller sample sizes in these two categories, our results suggest that two-way sexters may be at

greater risk across sexting groups. In contextualizing this risk, however, it is important to underscore that insertive anal intercourse carries a much lower risk of infection (6.5 per 10,000 exposures) than receptive anal intercourse (50 per 10,000 exposures) [20], and has been a strategy employed by MSM to minimize risk of infection if the HIV+ partner takes the receptive role in the sexual exchange (i.e., strategic positioning; [21]). However, we do not know whether YMSM who engage in insertive anal intercourse are diagnosed as HIV-negative, thereby increasing the potential to infect their receptive partners. Consequently, care should be taken when interpreting our findings, because we are unable to determine whether YMSM who sext are more or less vulnerable to HIV infection.

Although our study is one of the first to examine the association between sexting and YMSM's sexual risk behaviors, several limitations of our study should be noted. First, the overwhelming majority of our sample identified as gay, such that our findings may not be generalizable to YMSM who do not claim this identity. Furthermore, our sample was recruited online and may not necessarily reflect a representative sample of YMSM in the United States. Therefore, our results may not be generalizable. Third, our survey focused on single YMSM; it is possible that YMSM in relationships may use sexting differently to communicate with their partners. Fourth, self-report and social desirability bias may have influenced how participants answered survey questions; however, we made every effort to reinforce that answers were confidential. Finally, we employed a lifetime measure of sexting behavior in our analyses; however, this indicator does not fully characterize how sexting is linked to sexual risk among YMSM. Future research is necessary to identify specific links between these behaviors, including whether sexual risk is associated with how recently YMSM sexted, motivations for sexting, and the characteristics of the partners with whom they are exchanging sexts.

These limitations notwithstanding, our findings advance our understanding of sexting among YMSM. First, we examined the prevalence of sexting in a sample of YMSM using two different ways of operationalizing sexting. Compared with prior samples with predominantly heterosexual samples [3,6,7], we found YMSM reported a greater likelihood of sexting in their lifetime. Second, we found that the relationship between sexting and sexual risk behaviors may be contingent on the population being examined. Consistent with prior studies with young adults [6,7], we find YMSM who sext are more likely to be sexually active; however, we find partial support for an association between sexting and recent sexual risk. The relationship between sexting and sexual risk may be dependent on sexual role, with an increased likelihood of unprotected insertive anal intercourse being noted among two-way sexters. Taken together, our findings support Levine's [1] conclusion that in order to develop adequate sex education and risk prevention materials further qualitative and quantitative research should focus on the motivations for (and contexts in which) young adults use sexting and other technologies. Future research examining the processes by which sexting is linked to sexual risk is warranted.

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