

Sexually Explicit Media on the Internet: A Content Analysis of Sexual Behaviors, Risk, and Media Characteristics in Gay Male Adult Videos

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Abstract Recent research suggests that viewing sexually explicit media (SEM), i.e., adult videos, may influence sexual risk taking among men who have sex with men. Despite this evidence, very little is known about the content of gay male SEM on the Internet, including the prevalence of sexual risk behaviors and their relation to video- and performer-characteristics, viewing frequency, and favorability. The current study content analyzed 302 sexually explicit videos featuring male same-sex performers that were posted to five highly trafficked adult-oriented websites. Findings revealed that gay male SEM on the Internet features a variety of conventional and nonconventional sexual behaviors. There was a substantial prevalence of unprotected anal intercourse (UAI) (34 %) and was virtually the same as the prevalence of anal sex with a condom (36 %). The presence of UAI was not associated with video length, amateur production, number of video views, favorability, or website source. However, the presence of other potentially high-risk behaviors (e.g., ejaculation in the mouth, and ejaculation on/in/rubbed into the anus) was associated with longer videos, more views, and group sex videos (three or more performers). The findings of high levels of sexual risk behavior and the fact that there was virtually no difference in the prevalence of anal sex with and without a condom in gay male SEM have important implications for HIV prevention efforts, future research on the role of SEM on sexual risk taking, and public health policy.

Keywords Sexually explicit media · Pornography · Internet · Content analysis · Sexual risk behaviors · MSM

Introduction

The last decade has seen a dramatic evolution in the distribution of sexually explicit media (SEM), i.e., pornography, changing from a market based largely on the sale of DVDs and print media to an Internet-based distribution system (Cameron, 2012; Dines & Bialer, 2012). It has been suggested that 30 % of all Internet traffic is SEM-related and that average visits to a SEM website are considerably longer than those to major news websites (Didymus, 2012). Research by Ogas and Gaddam (2011) of over 400 million Internet searches found that 13 % of these searches (representing approximately 2 million people) were for sexual content. Furthermore, seven prominent SEM websites report a combined average of nearly 43 million daily visitors (Traffic Junky, 2012). Also, more than 20 million daily visitors access these sites through mobile devices (e.g., Smartphone). Consistent with the greater availability of SEM facilitated by the Internet, data from the General Social Survey shows a slow but steady increase in overall SEM consumption among U.S. men since the 1970s (Wright, 2013).

The greater access to SEM afforded by the Internet has perhaps had the greatest impact on men who have sex with men (MSM). Indeed, a substantial proportion of Internet-based SEM is targeted to and viewed by MSM. Recent research documented that 99 % of MSM viewed homosexual SEM in the past 3 months and 96 % viewed it on the Internet (Stein, Silvera, Hagerty, & Marmor, 2012). Researchers have noted that a greater percentage of MSM watch Internet-based SEM than heterosexual men (Traeen, Nilsen, & Stigum, 2006) and do so more frequently (Duggan & McCreary, 2004; Peter & Valkenburg, 2011). Despite

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the fact that MSM are frequent users of SEM, very little research has addressed issues regarding the content and use of SEM by MSM (regardless of media type). In a recent review of research on Internet-based SEM use conducted over a period of 10 years (up to 2010), most of the published studies did not assess the sexual identity or sexual orientation of participants or contained samples that were predominantly heterosexual (Short, Black, Smith, Wetterneck, & Wells, 2012).

The widespread use of SEM among MSM may not be without adverse consequences. Some have suggested that the proliferation of Internet-based SEM appears to coincide with decreases in safer sex practices and increases in HIV/STD acquisition among MSM (Rosser et al., 2012). Indeed, research has documented that greater use of SEM (in general) by MSM is associated with more male sexual partners (Eaton, Cain, Pope, Garcia, & Cherry, 2012), more unprotected insertive anal sex (Eaton et al., 2012), more interest in group sex (Weinberg, Williams, Kleiner, & Irizarry, 2010), lower body esteem (Duggan & McCreary, 2004; Morrison, Morrison, & Bradley, 2007), and may serve as a trigger for sexually compulsive behaviors (Parsons, Kelly, Bimbi, Muench, & Morgenstern, 2007). Furthermore, recent laboratory work has shown that MSM who viewed a sexually arousing video were less likely than those who viewed non-erotic videos to negotiate safer sex in response to a hypothetical partner who desired unprotected anal intercourse (UAI) (Maisto, Palfai, Vanable, Heath, & Woolf-King, 2012).

SEM that depicts unsafe behaviors (e.g., UAI, ejaculation on/ in or rubbed into the anus) may be particularly problematic, as it may lead some MSM to engage in similar sexual activities. Although Gold and Skinner (1992) and Gold, Skinner, and Ross (1994) found that watching SEM featuring UAI was not associated with engagement in unsafe sexual encounters later on that same day, more recent work by Stein et al. (2012) found that MSM who viewed a greater proportion of SEM depicting UAI in the past three months were more likely to engage in UAI within the same time frame. Furthermore, more than half of their participants also indicated that the type of SEM they watched influenced their own sexual behavior. Viewing SEM in which unsafe sexual practices are commonly depicted may be most problematic for young MSM who frequently use SEM as a source of sexual information (Kendall, 2004; Kubicek, Beyer, Weiss, Iverson, & Kipke, 2010) and may, therefore, perceive risk behaviors such as UAI as normative.

Despite the evidence suggesting an association between viewing SEM and sexual risk behaviors among MSM, unanswered questions remain. Research has not examined which types of behaviors MSM might be exposed to when viewing SEM on the Internet, including UAI and other high-risk sexual behaviors. Unless Internet-based SEM contains these behaviors, the hypothesis that viewing UAI might contribute to risk behaviors may be unfounded. Furthermore, a high prevalence of UAI and other high-risk behaviors within SEM would offer greater support to the hypothesis that MSM are commonly exposed to UAI

in SEM (even if they do not specifically seek it out). To date, very little research has examined the content of gay male SEM and, as far as we are aware, none has examined the content of Internet-based gay male SEM. Recently, researchers have called for more attention to the types of SEM that are available to MSM (Eaton et al., 2012; Rosser et al., 2012; Silvera, Stein, Hagerty, & Marmor, 2009).

To address this gap in the literature, the current study content analyzed videos posted on the Internet depicting gay male sexual activity. Although this methodology has been applied to investigate SEM content, these studies have primarily included print materials (Palmer, 1979; Smith, 1976), heterosexual videos (Bridges, Wosnitzer, Scharrer, Sun, & Liberman, 2010; Brosius, Weaver, & Staab, 1993; Green, 2004; McKee, Albury, & Lumby, 2008; Palys, 1986), and websites marketing sexually violent content against women (Gossett & Byrne, 2002). A recent study compared the prevalence of condom use in both heterosexual and male homosexual films on DVD (Grudzen et al., 2009). They found that heterosexual films were less likely than homosexual films to portray condom use, particularly during scenes featuring anal intercourse (10 % vs. 78 %). However, as Silvera et al. (2009) caution, a considerable proportion of SEM distribution and consumption (Stein et al., 2012) occurs through the Internet and the prevalence of sexual risk behaviors in gay male SEM may have changed dramatically with the proliferation of Internet-based SEM.

Questions also remain regarding the factors associated with the prevalence of these sexual behaviors on the Internet. Characteristics of the videos themselves, such as the length of the video, may influence the behavioral content. Longer videos would present the opportunity for more behaviors and, therefore, could result in a greater prevalence of sexual risk behaviors. The websites may also vary in the behavioral content as different sites may cater to men with various behavioral preferences (Carballo-Diéguez et al., 2006; Horvath, Bowen, & Williams, 2006; Pequegnat et al., 2007). Performer characteristics may also contribute to the sexual behaviors presented. With the Internet, there has been a considerable increase in amateurs creating and uploading their own sexual content (Green, 2004). This amateur SEM is not subject to any porn industry testing initiatives (Green, 2004; Taylor et al., 2007) or safe-sex policies and, therefore, may be more likely to contain individuals engaging in various unsafe behaviors. Likewise, some SEM may present sexual behavior of a single or two performers whereas some SEM may portray the behaviors of multiple performers (i.e., group sex). To date, neither video characteristics (i.e., length, website) nor performer characteristics (i.e., amateur, number of performers) have been examined in relation to the presence of high-risk sexual content.

Beyond the content of the videos themselves, it is also critically important to understand which types of Internet-based SEM videos are viewed more often or more favored by MSM. Videos that are viewed by a wider audience or more favored may

have greater influence on subsequent behaviors. Given such consumer preference information is virtually absent from the literature (Fisher & Barak, 2001), there is a critical need to address this issue. Content analysis is typically focused on the behavioral content of the media being examined (Cowan, 2002); however, unique to the context of Internet-based SEM is that many of the websites provide additional information regarding the frequency with which each video has been viewed and the average viewer favorability rating of each video. As such, the current study examined whether the presence of certain sexual behaviors and video characteristics were associated with greater viewing and favorability. If SEM containing UAI and other high-risk behaviors are viewed more often or more favorably rated than SEM without such behavioral content, then this would suggest that MSM may desire and search for such content.

The current study conducted a content analysis of gay male SEM on the Internet to examine the prevalence of various sexual behaviors depicted, the association of behavioral content with video and performer characteristics, and whether SEM containing sexual risk behavior was viewed more often or rated more favorably than SEM without such behaviors.

Method

Sample Selection

To examine the sexual behavior content of gay male Internet SEM, a total of 302 online videos were selected and subjected to content analysis (Cowan, 2002; Krippendorff, 2004) between April and July 2012. Overall, the research team viewed and coded over 40 h of SEM video.

The selection of the SEM websites for content analysis was based on several criteria designed to increase the representativeness of the resulting sample of videos. First, we evaluated nine Internet SEM websites using both a website informational database (Alexa) and data from an advertisement broker for adult SEM sites (TrafficJunky). Based on traffic and usage patterns (i.e., daily and monthly visits; length of time in operation; intended audience), we selected five websites to target for the study: GayTube, PornHub, YouPorn, XTube, and Xvideos. Web and mobile traffic to most of these sites ranged from as few as 1,000,000 daily visitors to as many as 31,250,000 (TrafficJunky.net, 2012). Although the initial sampling frame of nine SEM websites was certainly not exhaustive, the decision was made to focus our data collection efforts on sites that (1) were free and therefore accessible to the broadest possible population of MSM; (2) have higher web traffic and therefore are widely used by MSM; and (3) offer a broad selection of SEM content as opposed to theme-based sites that feature particular content (e.g., bareback, fetish, racial/ethnic group) that could bias the sample or over-represent certain behaviors. Because all of these websites serve as hubs for distributing and advertising videos

from multiple other free, for pay, amateur, or theme-based websites, the content of the websites included in our analysis is likely to be representative of those other websites as well.

Procedure

The research team utilized elements of time–space sampling (Groß, 2010; Stueve, O'Donnell, Duran, Sandoval, & Blome, 2001) to select videos from the sampling frame. First, we used a random-digit generator to select one of the five SEM websites. Next, a 1-h block of time from the available staff hours was randomly selected during which videos would be selected, viewed, and coded. Staff hours varied throughout the study and included weekdays, evenings, and weekends. Videos for coding were selected by accessing the section of the website that contained male same-sex videos (e.g., “Gay”). Next, researchers identified the most recently uploaded or most watched videos, based on the order in which each website presented the videos. Finally, raters watched and coded consecutive videos for the assigned 1-h block of time. Coding for a single 1-h block was chosen to prevent fatigue and increase coding reliability (Cowan, 2002). At one of the five websites used for this study (XTube), the continuous uploading of videos by users made it difficult to watch and code consecutive videos. To address this problem, coders selected the first and last videos per screen page. Study procedures were reviewed by the university Institutional Review Board and determined to be non-human subjects research.

Measures

Following standard content analysis procedures (Cowan, 2002; Krippendorff, 2004), the coding system for content analysis of videos was developed prior to data collection based on watching a preliminary sample of videos. Specifically, 10 video scenes across the five websites (two scenes per website) were used to identify potential behavioral content of interest that was present in the videos. Based on this, a data collection sheet was generated that included a series of descriptive and behavioral codes. Each code included on this sheet was systematically defined so that all coders were clear and unanimously agreed on what constituted and what did not constitute the presence of each code/behavior (Cowan, 2002). Several codes were modified or added to this sheet following the first coding shift in order to address ambiguities and account for behaviors that were not identified during the preliminary phase.

Each video was coded for various descriptive characteristics, including title, categories and tags (key words describing each video), length (minutes and seconds), date of video upload, favorability (viewer ratings), number of views, number of viewer comments, and video type (professional/semi-professional vs. amateur). Behavioral codes included a comprehensive set of conventional (e.g., kissing, masturbation, oral sex with or without a condom, rimming, anal sex with or without a condom) and

nonconventional (e.g., fisting, bondage/sadomasochism, spanking, water sports/urination, felching, snowballing) sexual activities. We also coded each video scene for the number of sexual performers, evidence of ejaculation, and substance use behavior (e.g., smoking, alcohol, poppers). The depiction of certain behaviors and performer characteristics were excluded from data collection if they required subjective judgments or could not be directly observed (e.g., race of performers, ejaculation when not visible), because such subjective judgments can result in poor reliability (Cowan, 2002). For all behavioral codes, coders were instructed to indicate the presence of all behaviors that appeared in each video, resulting in a dichotomous indicator for the presence of each behavior.

Inter-Coder Reliability

Three coders with master's-level or higher training participated in the data collection. A subsample of videos ($n = 104$, 34 %) were coded independently by two of the researchers in order to assess inter-coder reliability. Inter-coder reliability was calculated using Cohen's kappa (κ) for categorical codes and the Intraclass Correlation Coefficient (ICC) for the number of sexual performers in order to verify consistency in the coding of videos. Cohen's κ ranged from 0.71 to 1.00 across behaviors ($p < .001$). Reliability coefficients for high-risk sexual behaviors indicated substantial agreement between pairs of coders: anal sex without a condom (.90), presence of ejaculation in the anus (.78), ejaculation in the mouth (.85), felching (oral sucking of semen out of a partner's anus) (.85), snowballing (spitting semen into a partner's mouth following oral sex) (1.00), penile-anal insertion following ejaculation (1.00), and penile-mouth insertion following ejaculation in the anus (1.00). High agreement between pairs of coders was obtained for the number of sexual performers (ICC = .99), anal-insertive performers (ICC = 1.00), and anal-receptive performers (ICC = 1.00). Furthermore, coding pairs demonstrated consistent agreement regarding the type of video (i.e., professional/semi-professional vs. amateur; $\kappa = .88$). Reliability checks were conducted throughout the coding process to assess consistency across the entire data collection period (Cowan, 2002). When coding discrepancies were identified, discussions to resolve differences in the understanding of each code/behavior were held to ensure greater consistency in future coding.

Data Analysis

The prevalence of each sexual behavior present in the videos was computed as the percentage of videos in which the behavior appeared out of the total sample of 302 videos. Comparisons between videos that contained or did not contain specific behaviors were conducted using independent samples t tests for

normally-distributed continuous variables (e.g., video length, video favorability ratings), Mann–Whitney U tests for non-normally distributed continuous variables (e.g., number of times viewed), and Chi square tests for dichotomous and categorical variables (e.g., amateur vs. professional performers; one, two, or three or more performers; or website source). For comparisons of dichotomous behavior differences between variables containing more than two categories (e.g., one, two, or three or more performers; five website sources), post hoc 2×2 Chi square tests were conducted. To examine the correlation between two continuous variables, Pearson correlations were used for two normally distributed continuous variables (e.g., video length, favorability ratings, total number of behaviors in video) and Spearman correlations were used when one or more of the variables was non-normal (i.e., number of times viewed). Comparisons of categorical variables (i.e., videos with one, two, or three or more performers; video website sources) on continuous variables were conducted using ANOVA for normally-distributed variables (i.e., video length, video favorability ratings, total number of behaviors in video; with post hoc comparisons using Tukey's HSD) and Kruskal–Wallis test for non-normally distributed variables (i.e., number of video views; with post hoc comparisons using Mann–Whitney U tests). Statistically significant associations are reported at $p < .05$; Bonferroni corrections were applied to the alpha values obtained from post hoc comparisons of video website sources. To control for potential multicollinearity, we used multivariate modeling to examine predictors of video viewership (i.e., number of views) and favorability ratings based on significant bivariate associations. To further control for Type I error, we only interpreted the findings from the regression models. We modeled the (normally distributed) favorability ratings using multivariate linear regression. However, because the number of views reflects count data, it was modeled with negative binomial regression (Coxe, West, & Aiken, 2009). The amount of time from video posting to researcher coding was calculated and entered as an offset variable.

Results

A total of 302 Internet videos, representing a total of 40.75 h of video, were content analyzed. The most common behaviors presented in the videos were masturbation (78 %), anal sex (70 %), oral sex (66 %), kissing (34 %), nipple stimulation (33 %), and anal fingering (20 %) (see Table 1). However, a number of potentially high-risk sexual behaviors were also commonly presented, including UAI (34 %), rimming (17 %), ejaculation in the mouth (8 %), and ejaculation in/on or rubbed into the anus (7 %). The prevalence of anal sex with a condom (36 %) and without a condom (34 %) did not significantly differ. Nearly all oral sex observed was unprotected (99.5 %). Various

forms of domination, including spanking (16 %) and bondage/sadomasochistic (BDSM) behaviors (10 %), were also present.¹ Substance use/smoking (5 %), water sports (2 %), dildo use (4 %), fisting (1 %), felching (1 %), and snowballing (1 %) were rare.

Videos ranged in length from 1.1 to 75.6 min ($M = 8.10$, $SD = 8.29$). Videos were coded as containing an average of 3.9 sexual behaviors ($SD = 2.0$, range = 0–10). On average, longer videos included more types of sexual behaviors, $r(300) = .56$, $p < .001$. Videos that contained kissing ($p < .001$), masturbation ($p < .001$), anal fingering ($p < .001$), anal sex ($p < .001$), oral sex ($p < .001$), any ejaculation ($p < .001$), or ejaculation on the face ($p < .05$) were each, on average, longer than those that did not include one of these behaviors (see Table 1). Consistent with this overall pattern, videos that contained potentially high-risk behaviors were also longer than those that did not, including rimming ($p < .001$), ejaculation in the mouth ($p < .01$), and ejaculation on/in the anus or rubbed into the anus ($p < .06$). However, videos containing UAI were not significantly longer than those that did not.

Although not all of the websites provided number of views or favorability ratings from the viewers, the majority (75 %, $n = 227$) included data on number of views; 80 % ($n = 241$) included favorability ratings. Despite selecting the most recently posted videos for analysis, videos had been watched an average of 47,986 times ($SD = 217,484$; range 1–2,790,550). Likewise, the favorability rating for the videos averaged at 83 % favorable ($SD = 14$ %, range, 10–100 %). Findings regarding whether videos containing certain behaviors were viewed more often or rated more favorably than videos not containing those behaviors are shown in Table 2. Videos that contained scenes of kissing ($p < .001$), anal fingering ($p < .01$), oral sex ($p < .001$), spanking ($p < .05$), rimming ($p < .10$), anal sex ($p < .001$), any ejaculation ($p < .001$), ejaculation on the face ($p < .001$), or ejaculation in the mouth ($p < .001$) tended to each have a higher number of views than videos that did not contain these behaviors. Favorability ratings were less significantly related to behavior. Videos that contained scenes of spanking ($p < .01$), anal sex ($p < .01$), or ejaculation ($p < .001$) were rated more favorably than those that did not contain these behaviors. Longer videos were viewed more, $r_s(225) = .28$, $p < .001$, and videos with more sexual behaviors were viewed more, $r_s(225) = .43$, $p < .001$, and more favorably rated, $r(239) = .17$, $p < .01$.

¹ Past research has raised concerns regarding the level of aggression, violence, and domination that exists within the context of heterosexual SEM (Bridges et al., 2010; Gossett & Byrne, 2002; Palys, 1986). We found that a substantial number of videos contained episodes of spanking and BDSM. However, these findings must be qualified. Much of the spanking present in the videos consisted of a single slap on the buttocks. Some BDSM behaviors were exhibited by solo performers. Videos containing BDSM among two or more performers in some cases did feature violence and aggression. However, our findings overall did not appear to demonstrate a high prevalence of violence or rape within gay male SEM on the Internet.

Table 1 Prevalence of sexual behaviors observed in SEM and differences in the length (in minutes) of videos that contain or do not contain specific sexual behaviors ($N = 302$)

Behaviors in videos	Prevalence		Video length			
	<i>n</i>	%	Present		Absent	
			<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Kissing	103	34	11.63	8.75	6.27	7.43***
Masturbation	234	78	9.30	9.00	3.95	2.16***
Anal fingering	59	20	12.22	9.23	7.09	7.74***
Oral sex	199	66	9.92	9.50	4.58	2.96***
Spanking	47	16	9.78	8.69	7.79	8.20
Sadomasochism	31	10	8.13	8.82	8.09	8.25
Rimming	50	17	11.54	8.62	7.41	8.07***
Any anal sex	211	70	9.10	9.14	5.76	5.20***
UAI	104	34	8.59	8.21	7.84	8.34
Any ejaculation	142	47	11.95	10.34	4.67	3.20***
Ejaculation on the face	26	9	11.25	8.87	7.80	8.19*
Ejaculation in the mouth	24	8	12.63	10.06	7.71	8.02**
Ejaculation in/on or rubbed into the anus	20	7	11.56	9.31	7.85	8.18†

† $p < .06$, * $p < .05$, ** $p < .01$, *** $p < .001$

Videos that contained UAI were not viewed more often or rated more favorably than videos that did not contain UAI.

Given the ease of creating sexually explicit videos and posting them to the Internet, the videos analyzed included both professionally produced and amateur videos. The largest proportion of videos was coded as professional (86 %). The content of professional and amateur SEM was found to significantly differ. Professional videos were more likely than amateur SEM to include kissing (37 % vs. 15 %, $p < .01$), oral sex (71 % vs. 32 %, $p < .001$), anal sex (74 % vs. 42 %, $p < .001$), and anal sex with a condom (40 % vs. 10 %, $p < .001$). In contrast, amateur SEM was more likely to include BDSM behaviors (20 % vs. 9 %, $p < .05$). Amateur videos also contained fewer behaviors ($M = 2.8$ vs. 4.1, $p < .001$) and had fewer views ($Mdn = 7,116$ vs. 254, $p < .001$), but were not significantly shorter or rated less favorably than professionally produced videos. There were no significant differences in any other behaviors, including UAI or ejaculation on the face, in the mouth, or on/in the anus.

Videos contained an average of 2.4 performers ($SD = 1.9$, range 1–23). A comparison of videos with one (11 %), two (69 %), and three or more (20 %) performers (i.e., group sex) identified several significant differences. As some behaviors required two or more people to perform, many behaviors were absent from videos with a single performer (e.g., kissing: 0 % vs. 36 % vs. 46 %, $p < .001$; rimming: 0 % vs. 19 % vs. 19 %, $p < .05$; oral sex: 0 % vs. 68 % vs. 97 %, $p < .001$; anal sex: 0 % vs. 79 % vs. 75 %, $p < .001$), but there were no significant differences in videos containing one versus more performers for activities that were possible of a single performer (e.g.,

Table 2 Differences in number of times viewed and favorability ratings of videos that contain or do not contain specific behaviors

Behaviors in videos	Number of views				Favorability rating			
	Present		Absent		Present		Absent	
	<i>Mdn</i>	<i>IQR</i>	<i>Mdn</i>	<i>IQR</i>	<i>M %</i>	<i>SD</i>	<i>M %</i>	<i>SD</i>
Kissing	8,907	27,028	4,757	11,546***	82.2	14.6	83.2	13.1
Masturbation	6,416	20,855	5,606	11,430	82.8	14.0	82.9	12.6
Anal fingering	8,750	32,005	5,895	12,651**	84.6	12.5	82.3	14.0
Oral sex	7,791	22,830	2,813	7,456***	83.5	13.1	81.2	15.1
Spanking	8,751	30,909	6,065	12,949*	87.8	7.6	81.7	14.5**
Sadomasochism	7,711	10,225	6,255	16,129	83.0	12.2	82.8	13.9
Rimming	9,213	29,721	6,190	13,826†	84.1	12.0	82.5	14.1
Any anal sex	6,989	22,035	4,480	10,741***	84.2	12.4	78.3	16.6**
UAI	6,325	21,008	6,239	13,284	83.8	15.0	82.2	13.0
Any ejaculation	8,662	28,247	4,912	7,861***	85.9	10.5	79.5	15.9***
Ejaculation on the face	16,090	55,096	6,009	12,831***	86.2	9.0	82.4	14.1
Ejaculation in the mouth	22,582	94,275	5,952	11,962***	85.4	12.8	82.5	13.8
Ejaculation in/on or rubbed into the anus	6,270	33,194	6,279	13,811	85.4	13.4	82.6	13.7

Due to the skewed distribution of the number of views, analyses were conducted using Mann–Whitney *U* test. Because different websites use different favorability rating scales (e.g., exact percentage vs. 5 stars vs. 10 stars), favorability ratings were recorded as the percentage either from the percentage provided by the website or by computing the number of stars out of the number of possible stars. The resulting variable was normally distributed and comparisons were made using *t*-test. Here, the mean percentages (*M %*) are reported

Mdn median, *IQR* interquartile range

† $p < .06$, * $p < .05$, ** $p < .01$, *** $p < .001$

masturbation: 85 % vs. 75 % vs. 83 %; ejaculation: 61 % vs. 45 % vs. 48 %). Consistent with this, videos with a single performer contained fewer different sexual behaviors (1.9 vs. 4.0 vs. 4.6, $p < .001$) than videos with two or three or more performers. Comparisons between videos with two versus three or more performers found that group sex videos were more likely to contain oral sex (97 % vs. 68 %, $p < .001$) and ejaculation in the mouth (17 % vs. 7 %, $p < .05$), but less likely to contain anal sex with a condom (29 % vs. 44 %, $p < .05$). Finally, videos with a single performer were viewed less (*Mdn* = 200 vs. 310 vs. 311, $p < .001$), were rated less favorably (*M* = 76.0 vs. 80.2 vs. 84.1, $p < .05$), and more likely to be amateur (55 % vs. 9 % vs. 9 %, $p < .001$) than those with two or three or more performers, but did not differ on video length.

Even though all five of the SEM websites examined contained a broad range of same-sex male behavior and did not specialize in a single type of porn (e.g., barebacking-specific websites), findings revealed that the websites differed considerably in the types of behaviors presented (see Table 3). Specifically, there were significant website differences in the prevalence of kissing ($p < .001$), masturbation ($p < .05$), rimming ($p < .05$), anal fingering ($p < .01$), anal sex ($p < .001$), oral sex ($p < .001$), ejaculation ($p < .001$), and ejaculation in the mouth ($p < .05$). The five websites also differed on the prevalence of amateur videos ($p < .001$), the prevalence of single performer videos ($p < .001$), the length of the average video

($p < .001$), the total number of behaviors presented ($p < .001$), the number of views ($p < .001$) and the favorability rating ($p < .001$). However, there were no specific site differences in UAI or ejaculation in, on, or rubbed into the anus. Lastly, a thorough review of each website uncovered no evidence of safe sex messaging, sexual health education, or consumer warnings about unsafe content in featured videos.

Multivariate Analyses

Variables that were significantly associated with the number of video views in bivariate analyses were entered into a negative binomial regression model. The first model included video type (amateur vs. professional), number of performers, video length, SEM website, and total number of behaviors as predictors and was statistically significant, $\chi^2(8, N = 227) = 406.14$, $p < .001$. Amateur videos had fewer views than professionally-produced videos (OR = .53, 95 % CI = .34–.83, $p < .01$). Lower viewership was also associated with videos posted to XTube (relative to GayTube) (OR = .06, 95 % CI = .04–.10, $p < .001$). Videos containing two (OR = 3.07, 95 % CI = 1.85–5.10, $p < .001$) and three or more performers (OR = 14.34, 95 % CI = 7.75–26.54, $p < .001$) had more views than videos with a solo performer. Furthermore, the presence of more behaviors was associated with more video views (OR = 1.14, 95 % CI = 1.02–1.28, $p < .05$). Due to this finding, to examine if specific types (rather than just the number) of behaviors were viewed more, a second

Table 3 Differences in the prevalence of sexual behaviors, performer characteristics, and video characteristics by video source

Behaviors in videos	Video source					Post hoc
	GayTube A	PornHub B	YouPorn C	XTube D	Xvideos E	
Kissing***	18 %	53 %	42 %	3 %	40 %	A, D < B, C, E
Masturbation*	67 %	92 %	80 %	79 %	72 %	A < B
Anal fingering**	18 %	37 %	21 %	5 %	15 %	D, E < B
Oral sex***	71 %	88 %	73 %	11 %	68 %	D < A, B, C, E
Spanking	14 %	27 %	14 %	5 %	17 %	
Sadomasochism	14 %	14 %	6 %	16 %	8 %	
Rimming*	10 %	27 %	17 %	3 %	21 %	D < B
Any anal sex***	57 %	82 %	71 %	40 %	85 %	A, D < B, E; D < C
UAI	39 %	43 %	32 %	24 %	35 %	
Any ejaculation***	12 %	69 %	57 %	47 %	44 %	A < B, C, D, E; E < B
Ejaculation on the face	4 %	16 %	11 %	3 %	7 %	
Ejaculation in the mouth*	4 %	14 %	12 %	0 %	5 %	
Ejaculation in/on or rubbed into the anus	2 %	14 %	6 %	5 %	7 %	
Total number of sexual behaviors***	3.0	5.4	4.2	2.2	4.0	A, D < B, C, E; C, E < B
Amateur***	6 %	6 %	5 %	71 %	6 %	A, B, C, E, < D
Single performer***	12 %	3 %	21 %	58 %	6 %	A, B, C, E < D
Views (<i>Mdn</i>)***	6,409	7,871	10,199	128	–	D < A, B, C
Favorability ratings***	85.0	75.5	83.5	85.0	85.8	
Video length***	3.14	14.55	9.87	5.75	6.33	A, C, D, E < B; A < C

Omnibus Chi square: * $p < .05$, ** $p < .01$, *** $p < .001$

Significant ($p < .05$) differences in the post hoc comparisons are indicated in the last column. Xvideos does not provide number of views, so data on views were not available for this website. Bonferroni corrections applied to post hoc comparisons ($p < .01$)

model was conducted with those behaviors (kissing, anal fingering, any oral sex, spanking, rimming, any anal sex, & ejaculation in the mouth) that were significantly associated with number of views in bivariate analysis. This model was also statistically significant, $\chi^2(7, N = 227) = 227.61, p < .001$. The presence of kissing ($OR = 1.46, 95\% CI = 1.09–1.96, p < .05$), anal fingering ($OR = 2.02, 95\% CI = 1.37–2.96, p < .001$), any oral sex ($OR = 2.29, 95\% CI = 1.68–3.14, p < .001$), spanking ($OR = 2.48, 95\% CI = 1.56–3.95, p < .001$), any anal sex ($OR = 2.67, 95\% CI = 1.98–3.60, p < .001$), and ejaculation in the mouth ($OR = 1.90, 95\% CI = 1.16–3.11, p < .05$) were all associated with greater viewership. Rimming was associated with lower viewership ($OR = .48, 95\% CI = .33–.71, p < .001$).

Variables that were significantly associated with video favorability in bivariate analyses were entered into a multivariate linear regression model. The first model included number of performers, total number of behaviors, and SEM website and was statistically significant, $F(7, 233) = 7.57, p < .001, R^2 = .19$. Videos featuring three or more performers were rated less favorably than videos with two performers ($\beta = -.13, p < .05$). Greater favorability was strongly predicted by SEM website [GayTube ($\beta = .35$), YouPorn ($\beta = .38$), & Xvideos ($\beta = .45$), $p < .001$; XTube ($\beta = .16, p < .05$) as compared to Pornhub] and by more total behaviors

($\beta = .33, p < .001$). Due to the latter finding, to examine if videos containing specific behaviors (rather than just the number of behaviors) were rated more favorably, a second model was conducted with those behaviors (spanking, any anal sex, & any ejaculation) that were statistically significant in bivariate analysis. This model was also significant, $F(3, 237) = 9.46, p < .001, R^2 = .11$. The presence of spanking ($\beta = .15, p < .05$), anal sex ($\beta = .17, p < .01$), and ejaculation ($\beta = .22, p < .001$) were significantly associated with greater favorability ratings.

Discussion

Despite the dramatic growth of the use of the Internet for viewing SEM (Cameron, 2012; Dines & Bialer, 2012; for review, see Rosser et al., 2012), the near universal use of Internet-based SEM by MSM (Stein et al., 2012), and the interest in the role of viewing Internet-based SEM on the sexual risk behaviors of MSM (Rosser et al., 2012; Stein et al., 2012), there remains a lack of information on the types of sexual behaviors, including high-risk behaviors, that are contained in the SEM viewed by MSM on the Internet (Eaton et al., 2012; Rosser et al., 2012).

Our findings documented a wide variety of sexual behaviors within gay male SEM on the Internet, including a substantial prevalence of high-risk sexual behaviors. Over one third of all SEM analyzed included episodes of UAI. Furthermore, the prevalence of UAI was no different than that of anal sex with a condom (34 % vs. 36 %). In addition, a notable minority of videos included other high-risk sexual behaviors (e.g., ejaculation in the mouth, and ejaculation on, in, or rubbed into the anus). These findings differ from past research on non-Internet-based gay male SEM. For example, in the only other study to examine the content of gay male SEM, Grudzen et al.'s (2009) analysis of DVD-based SEM found that UAI was less frequent (18 %) ² than found here (34 %) and protected anal sex was more frequent (62 %) than found here (36 %). Although these findings suggest the possibility of a shift in the risk behavior content of gay male SEM coinciding with the move from DVD-based to Internet-based distribution, there are not enough studies to make any definitive conclusions as to whether there has been a change in the portrayal of unsafe practices, and, if so, whether it is due to the change in media type or just an increased acceptance of risk practices over time. Regardless, this increase in risk content raises important questions about the potential influence of viewing UAI (or other high-risk sexual behaviors) on subsequent sexual risk behaviors (Rosser et al., 2012; Stein et al., 2012). Likewise, the finding that the prevalence of anal sex with and without condoms was similar suggests that SEM may normalize sexual risk behaviors among MSM.

Our findings further documented that a number of video-related and performer-related characteristics were associated with the sexual behaviors within gay male SEM on the Internet. Specifically, longer videos, videos with two or more performers, and professionally/semi-professionally produced videos contained significantly more types of sexual behaviors than shorter videos, videos with solo performers, and amateur videos. Likewise, significant differences were identified between the five SEM websites in the number of types of behaviors observed. Nevertheless, video and performer characteristics were not consistently associated with greater risk behaviors, including UAI. However, professional videos and videos with fewer than three performers were more likely to include anal sex using condoms. Likewise, there was some indication that ejaculation in the mouth and/or anus was more common in longer videos, in videos containing three or more performers, and from specific SEM websites. These findings suggest that while video characteristics are not strongly related to risk, there was some evidence that amateur videos, group sex videos, and certain websites may contain more sexual risk behaviors. As no previous research has examined the association of these factors with the sexual

risk behaviors depicted in gay male SEM on the Internet, further research into these factors is needed.

Given the virtual lack of research on consumer preference for SEM content (Fisher & Barak, 2001), we also examined factors associated with indicators of video preference by MSM. Our findings documented that each gay male SEM video on the Internet, despite selecting for videos that were the most recently posted, was viewed an average of nearly 50,000 times and had favorability ratings of over 80 %, suggesting widespread use by MSM. Further, both our bivariate and multivariate analyses demonstrated that videos containing more behaviors and specific types of behaviors (i.e., anal sex, ejaculation) were associated with a greater number of views and higher favorability ratings. However, videos containing UAI were not viewed more or rated more favorably than those without UAI. Nevertheless, videos containing rimming, anal sex, anal sex with ejaculation in general, in the face, and in the mouth were associated with greater viewership, greater favorability, or both. These findings suggest that many MSM did prefer and were more likely to view videos that contained a variety of different high-risk sexual behaviors. As such, not only do our findings document that these videos contain significant levels of sexual risk behavior, but also suggest that those videos that contain risk behaviors are watched more than those that do not.

Implications

Our findings have a number of potential implications for HIV prevention research, intervention efforts, and policy. The documentation of the prevalence of the types of sexual behaviors, including various risk behaviors, present in Internet-based SEM is a critical foundation for future research to examine the role of SEM on sexual risk behaviors among MSM. Although research has begun to link the viewing of SEM with sexual risk behaviors among MSM (Eaton et al., 2012; Stein et al., 2012), further research replicating and extending those findings is needed to inform intervention efforts. Currently unresolved in this literature is the question of whether the frequent viewing of SEM in general or UAI in particular is associated with subsequent sexual risk taking. Our findings suggest that sexual risk behaviors are common and frequently viewed in gay male SEM and, therefore, provide a basis for further examination as to whether viewing UAI and other risk behaviors may be associated with engagement in similar behaviors. Further, the identification within SEM of a number of additional risk behaviors beyond UAI (e.g., ejaculation in the mouth; ejaculation on/in or rubbed into the anus) suggests that future research may want to expand the hypothesis to include the viewing of various sexual risk behaviors in SEM that may also contribute to engaging in subsequent sexual risk behaviors.

The current research also offers some insights that may be useful for the development and targeting of future intervention efforts. Evidence from this study demonstrates that SEM

² To calculate prevalence consistent with our study, percentages were based on the total number of homosexual scenes rather than the number of homosexual scenes featuring anal sex.

containing various high-risk sexual behaviors (e.g., ejaculation in the mouth, etc.) was viewed more often than videos that did not contain these behaviors. This suggests that some MSM may be motivated to search for and view SEM that contains sexual risk behaviors. It is currently unclear whether the preference for viewing risk behaviors is because MSM experience a greater arousal by viewing risk behaviors or if this is specific to a certain group of MSM (e.g., the more compulsive, barebackers, HIV-positive) or whether this influences their subsequent sexual desires and behavior. However, it does suggest that there is a group of MSM who seek out SEM that contains sexual risk behaviors. Therefore, further investigation is needed to determine what motivates the viewing of SEM containing high-risk behaviors and the potential causal direction of the relationship between viewing these types of SEM and sexual risk. Research is also needed to inform potential intervention efforts, including whether interventions should target the viewing of SEM in general, UAI specifically, or a broader selection of sexual risk behaviors within SEM. Likewise, additional research is needed to determine if there are specific groups for whom SEM may adversely influence their sexual risk behaviors (e.g., sexual compulsives) (Parsons et al., 2007) and other groups for whom SEM may provide a potentially safer sexual outlet than in-person sexual contact.

In addition to providing some data to inform research and interventions, because our research addressed the content of SEM itself, it also serves to inform interventions with SEM performers. Specifically, we found that many videos (and by extension many performers) engaged in UAI and other sexual risk behaviors. Our findings suggest that this is particularly true for amateur performers who create SEM content outside of the supervision of professional SEM production companies. As such, there appears to be a need for renewed efforts to promote condom use among gay male SEM performers. Although voluntary testing initiatives aimed at curtailing infectious disease transmission have been implemented within mainstream SEM (Taylor et al., 2007), this approach has not been 100 % effective. Indeed, the reliability of HIV test results are reduced by a combination of factors, including the frequency with which performers engage in sexual activity, the number of sexual partners with whom performers come into contact, acute infection periods, and the fact that HIV tests are not capable of detecting infections in a timeframe consistent with performer schedules (de Cesare, 2006). Therefore, voluntary testing may be insufficient to prevent HIV/STD transmission, thus highlighting the continued need for condom use promotion efforts among SEM performers.

The findings reported here also have policy-level implications for producers and distributors of Internet SEM. Condom use was originally a self-imposed practice in the gay male SEM industry for the occupational safety of performers. However, given that emerging research suggests that viewing risky sexual behavior may contribute to sexual risk behavior (Stein et al.,

2012), condom use in SEM could have implications for the behavior of SEM consumers. Yet, the high prevalence of UAI (and other risk behaviors) found here suggests that these self-imposed practices regarding condom use in the gay porn industry may be waning. With the transition to the Internet (and the proliferation of semi-professional and amateur producers), self-imposed condom use may no longer be the standard among some producers. Indeed, Hurley (2009) goes so far as to suggest that “With increasing deregulation and competition from the internet, porn studios are exploiting taboos to maintain market share.” Although condom use in adult films was recently mandated by the Los Angeles City Council (City of Los Angeles, 2012), it remains to be seen what impact this will have on producers of “bareback” SEM and whether this can be implemented on a larger scale.

Beyond professionally-produced SEM, the Internet has created opportunities for amateurs (who are therefore not subject to any safe-sex policies or testing initiatives) to easily record and upload their own sexual content (Green, 2004). Consistent with this, we found that amateur SEM was less likely to use condoms for anal sex than professionally produced SEM. Likewise, videos that contained scenes of group sex (i.e., three or more performers) were less likely to use condoms for anal sex (and ejaculation in the mouth). These findings suggest that efforts may be needed to encourage Internet websites that distribute SEM to consider putting limits on the sexual risk behaviors that are included in the video content posted to their sites, regardless of how it is produced. However, concerns about reductions in web traffic may influence distributors’ decisions to limit videos featuring sexual risk behaviors. Alternatively, websites could include safe sex messaging to consumers and/or use warning screens for videos featuring high-risk behavior. Perrin et al. (2008) have made similar suggestions about the use of warning labels or a rating system (such as used in movies or video games) to warn consumers of high-risk behavior content. Notably, we found no evidence of safe sex messaging, sexual health education, or consumer warnings regarding unsafe content of SEM videos featured on any of the websites used in this study. This is consistent with a previous content analysis of heterosexual-themed Internet SEM (Green, 2004).

Limitations

This study had several limitations that warrant discussion. First, our sampling strategy was limited to five websites offering free sexually explicit content; therefore, our findings may not generalize to paid theme-based sites. However, given the selected websites distribute videos from multiple free, for pay, amateur, or theme-based sites and the high traffic patterns of the websites used for this study (compared to paid sites), our findings showcase the diversity of gay male SEM that is available for free. Second, the findings reported in this article were based on a small sample of web-based SEM videos ($N = 302$). However,

our sample was comparatively larger than a previous content analysis of 50 DVD-based gay male SEM scenes (Grudzen et al., 2009). Another potential limitation was that the favorability ratings and the number of views per video were based entirely on data provided by the specific websites. Therefore, we have no way of knowing to what extent these figures may be inflated by SEM producers (who may attempt to artificially increase their views/ratings) and consumers (e.g., a single person watching the same video multiple times). Lastly, the study did not code for performers' race or ethnicity due to the highly subjective nature of determining this type of information.

Despite these limitations, this report presented findings of the first known study to examine the behavioral content of gay male SEM available on the Internet. The documentation that sexual risk behaviors are widely available in gay male SEM is a necessary step in the investigation of whether SEM may be a contributing factor to sexual risk behaviors among MSM (Eaton et al., 2012; Rosser et al., 2012; Stein et al., 2012). As such, these findings provide a basis for further research, intervention, and policy efforts to understand the role of SEM in the sexual risk behaviors of MSM.

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