



Original article

“Sexting” and Its Relation to Sexual Activity and Sexual Risk Behavior in a National Survey of Adolescents

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A B S T R A C T

Purpose: To examine the relation between “sexting” (sending and sharing sexual photos online, via text messaging, and in person) with sexual risk behaviors and psychosocial challenge in adolescence.

Methods: Data were collected online between 2010 and 2011 with 3,715 randomly selected 13- to 18-year-old youth across the United States.

Results: Seven percent of youth reported sending or showing someone sexual pictures of themselves, in which they were nude or nearly nude, online, via text messaging, or in person, during the past year. Although females and older youth were more likely to share sexual photos than males and younger youth, the profile of psychosocial challenge and sexual behavior was similar for all youth. After adjusting for demographic characteristics, sharing sexual photos was associated with all types of sexual behaviors assessed (e.g., oral sex, vaginal sex) as well as some of the risky sexual behaviors examined—particularly having concurrent sexual partners and having more past-year sexual partners. Adolescents who shared sexual photos also were more likely to use substances and less likely to have high self-esteem than their demographically similar peers.

Conclusions: Although the media has portrayed sexting as a problem caused by new technology, health professionals may be more effective by approaching it as an aspect of adolescent sexual development and exploration and, in some cases, risk-taking and psychosocial challenge.

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IMPLICATIONS AND
CONTRIBUTION

In a national survey of 13- to 18-year-olds, “sexting” online, via text messaging, and in person is positively associated with risky sexual behavior and substance use and negatively associated with high self-esteem. Findings suggest that sexting is reflective of adolescent sexual development and exploration and, in some cases, risk-taking and psychosocial challenge.

“Sexting” originated as a media term [1] that generally refers to sending sexual images via text messaging and can also include uploading sexual pictures to Web sites. Sexting has received attention from legal scholars because some youth are creating and distributing images that meet definitions of child pornography under criminal statutes [2]. Whether there are adolescent

health implications, however, is less well understood. In a study of high school students across seven schools in Texas, youth who reported sharing sexual photos of themselves were more likely to be dating and to have had sex [3]. The study also found that sexting was a marker for risky sexual behavior for female but not male students. On the other hand, among high school student participants in the Youth Risk Behavior Survey in Los Angeles, sexting was significantly associated with being sexually active but the relation with condom use at last sex was borderline significant [4]. This would suggest that sharing or posting sexual pictures is perhaps more reflective of typical sexual expression in romantic relationships among adolescents. Studies of young adults also are conflicting: some have found sexting is associated with risky sexual behavior [5], whereas others have not [6,7].

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Disclaimer: The findings and conclusions in this article are those of the authors and do not necessarily represent the official position of the National Institute of Child Health and Human Development.

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Further research is needed before more concrete conclusions can be drawn about where sexting falls on the spectrum of healthy versus risky sexual behavior for young people [8].

The importance of studying sexting at the national level is evident by the wide variation in prevalence rates between regional and national studies. Although regional studies report that between 15% [4] and 28% [3] of high-school-aged youth have sent a sexual photo, national studies among adolescents report much lower rates (3% [9] and 4% [10]). Rates may differ for a variety of reasons, including age variation of youth across studies, variations in behaviors in urban versus nonurban settings and/or different regions of the country, variations of the mode (i.e., texting, online, in person) included in the definition of sharing images, and differences in the types of behaviors captured when defining sexting. In the present study, we use a broad definition of sexting: “sending or showing someone sexual pictures of yourself where you were nude or nearly nude.”

Sexual relationships are normative and age-typical experiences for adolescents, and these relationships have significant implications for health, adjustment, and psychosocial functioning [11,12]. Sexually curious behavior is reflective of typical sexual development during adolescence [13–15]. Sharing or posting sexual pictures of oneself may therefore be reflective of usual sexual expression in romantic relationships in adolescence. Alternatively, sexting may be a marker for involvement in a larger continuum of risky sexual behaviors. Certainly, sexting may also have a function in both of these arenas. In the present study, we examine how sexting is related to sexual behavior. We also examine how it relates to psychosocial functioning, as this is less well understood. To examine whether potential differences in previous findings are perhaps related to age differences, correlates are examined for younger and older youth separately. As the first national study to examine these adolescent health outcomes, findings will inform how sexting falls into the larger rubric of adolescent sexual behavior in today’s digital age [16].

Methods

Data for the Teen Health and Technology Study were collected online between August 2010 and January 2011 from 5,907 13- to 18-year-olds in the United States. The survey protocol was reviewed and approved by the Chesapeake Institutional Review Board, the University of New Hampshire Institutional Review Board, and GLSEN (Gay, Lesbian & Straight Education Network) Research Ethics Review Committee. A waiver of parental consent was granted to protect youth who would be potentially placed in harm’s way if their sexual orientation was unintentionally disclosed to their caregivers.

Participants were recruited from (1) the Harris Poll Online (HPOL) opt-in panel ($n = 3,989$ respondents) and (2) through referrals from GLSEN ($n = 1,918$ respondents) to obtain an oversample of lesbian, gay, bisexual, and transgendered youth. Because the focus in this article is on the general population of adolescents, the current analyses are restricted to the HPOL sample. Members were recruited through a variety of methods, including targeted mailings, word of mouth, and online advertising. Panelists enrolled in the opt-in panel at the HPOL Web site, <http://www.harrispollonline.com>. HPOL members were randomly recruited for survey participation through e-mail invitations that referred to a survey about their “online experiences.” The survey questionnaire was self-administered online. Qualified respondents were (1) U.S. residents, (2) 13–18 years old, (3) those who were in fifth

grade or above, and (4) those who provided informed assent. The median survey length was 23 minutes.

Recent survey response rates are noticeably lower than in the past [17,18]. The response rate for the HPOL sample was 7%. It was calculated as the number of individuals who started the survey divided by the number of e-mail invitations sent, less any e-mail invitations that were returned as undeliverable.

Measures

Sexting was defined as sexual photo sharing through any mode. The behavior was queried based on a question developed by Lenhart et al. [10]: “In the past 12 months, how often have you sent or showed someone sexual pictures of yourself where you were nude or nearly nude? We are talking about times when you wanted to do these things. Please keep in mind that these things can happen anywhere including in person, on the Internet, and on cell phones or text messaging.” Youth who responded positively were asked to indicate how the pictures were shared: in person, by text message, online, or in some other way. Youth who had shared pictures online were asked follow-up questions about the most recent incident, including whether they knew the recipient offline and the age difference between the respondent and the recipient.

A range of *sexual activities* ever engaged in were also queried. Items 1, 2, 5, and 6 were modified from the Protecting the Next Generation project [19] and items 3 and 4 were created for this survey: (1) kissed or been kissed by someone romantically; (2) fondling (touching someone else’s body or someone else touching your body in a sexual way); (3) oral sex (stimulating the vagina or penis with the mouth or tongue); (4) sex with another person that involved a finger or sex toy going into the vagina or anus; (5) sex where a penis goes into a vagina (referred to here as “vaginal sex”); and (6) sex where a penis goes into an anus (referred to here as “anal sex”). All behaviors referred to “when you wanted to”, in order to distinguish between wanted and unwanted experiences.

Sexual risk behavior was queried for youth who reported having had vaginal and/or anal sex, including the number of past-year sex partners, whether their most recent partner has ever had a sexually transmitted infection (STI), whether they talked about condoms before the first time they had sex with their current sex partner the first time, and general frequency of using a condom (1 [none of the time] to 5 [all the time]).

Depressive symptomatology was measured with the Center for Epidemiologic Studies Depression Scale-revised 10-item version for adolescents [20], social support with the Multidimensional Scale of Perceived Social Support [21], and past-year substance use using measures from the Youth Risk Behavioral Survey [22]. Further detail is available on request.

Weighting and identifying the final analytical sample

Data were weighted to known demographics of 13- to 18-year-olds based on the 2009 Current Population Survey [23], including biological sex, age, race/ethnicity, parents’ highest level of education, school location, and U.S. region. Next, a validity check was applied (i.e., survey response time less than 5 minutes; reporting one’s age at the beginning and end of the survey to be more than 1 year apart; and “straight lining,” providing the exact same response to each item in the last two grids of the survey). As a result, 69 participants were dropped. Youth who identified as transgender or gender non-conforming were excluded ($n =$

62) because gender identity is likely related to sexting in ways that could not be examined within the scope of the current article. Finally, missing responses (i.e., “do not know”) on non-outcome variables (i.e., everything but the sexting indicators) were imputed using Stata version 11 statistical software’s “impute” command [24]. To avoid imputing truly nonresponsive participants, respondents’ valid answers were required for at least 80% of the main variables; 143 respondents (4% of the 3,989) were dropped as a result. The final analytic sample was 3,715 youth.

Data analyses

First, differences in demographic characteristics were examined for youth who reported sexting versus youth who did not report sexting in the past year. Statistical significance was determined using *F* statistics, which are chi-square statistics that take the weighting scheme into account, for categorical data and linear regression for continuous data. Next, details of the most recent sexting incident were described for the overall sample, as well as by biological sex and age group (younger [13–15 years old] vs. older [16–18 years old] youth). Differences were again tested for statistical significance, using *F* statistics for categorical data and linear regression for continuous data. Finally, rates of sexual behavior, risky sexual behaviors, and psychosocial indicators were examined for differences by past-year sexting behavior by stratifying the sample by age group and biological sex. Differences were quantified using logistic regression. Odds ratios were adjusted for demographic characteristics: youth age, biological sex, sexual identity, ethnicity, race, household income, region (i.e., urban, suburban, rural), being born-again Christian (which may relate to sexual behavior [25]), school type (i.e., private, public, home schooled), and caregiver educational attainment.

Results

Seven percent ($n = 267$) of youth 13–18 years of age reported sexting (sending or showing someone sexual pictures of themselves in which they were nude or nearly nude) in the past year: 1% did so in person, 5% by text message, 2% online, and .2% in some other way. Just greater than 1% ($n = 42$) of youth reported sexting through more than one mode. Among youth under 18 years of age, 7% ($n = 212$) admitted that they sent or showed someone a sexual picture of themselves. The percentages by mode were similar to the overall sample.

Females (9%) were significantly more likely than males (6%) to engage in sexting behavior ($F(1, 3709) = 8.4, p = .004$), although increasing age was associated with increasing rates of sending or showing sexual pictures for both sexes (Figure 1). As shown in Table 1, male and female youth who sent or showed sexual pictures were significantly older and more likely to be Hispanic as well as lesbian, gay, bisexual, or other nonheterosexual identity (LGB). Males who sent or showed sexual photos were more likely to be living in a small town compared with males who did not send or show sexual pictures. Females who sent or showed sexual photos were less likely to be born-again Christian. Aside from age and sexual identity, differences were not noted between youth who did and did not send or show sexy photos among younger youth (Table 2). Among older youth, those who sent or showed sexual photos were more likely to be female, Hispanic ethnicity, or LGB and were less likely to be born-again Christian.

Details of the most recent online incident

The 79 youth who reported sending or posting sexual photos online were asked follow-up questions about the recipient’s age and sex and whether the recipient was known offline. Most youth (69%: 76% of females and 62% of males) who sent or showed sexual pictures online did so with someone they knew offline. Ninety-five percent of female youth sent or showed sexual pictures to males and 5% to other females. In contrast, 26% of the males sent or showed sexual pictures to other males and 74% to females. For both males and females, sexual identity predicted sending or showing a sexual photo to someone of the same sex: seven of the nine males (66%) and two of the three females (68%) who sent sexual pictures to someone of the same sex were LGB youth.

Almost half (46%) of the recipients were the same-aged youth: 41% were older, 7% were younger, and 6% of respondents said they did not know what their age difference might be. Differences were noted by sex: more females (61%) than males (20%) sent or showed sexual pictures with someone older, whereas more males (10%) than females (1%) sent or showed sexual pictures to someone of unknown age ($p = .003$). Among youth who sent or showed sexual pictures to different-aged youth, 79% said the recipient was within 4 years of their own age. In all cases when the age differed by more than 4 years, the recipient was older not younger. Differences, although nonsignificant because of small cell sizes, were noted by sex: among youth who sent or showed sexual pictures to someone older, 21% of females, compared with 2% of males, reported the recipient was more than 4 years older than them ($p = .40$).

Relations between sending/showing sexual photos, sexual behavior, and risky sexual activity

Compared with 63% of youth who had ever had vaginal or anal sex, 14% of youth who had not had vaginal or anal sex sent or showed sexual photos of themselves in the past year ($p < .001$). As shown in Tables 3 and 4 (by sex and age group, respectively), all sexual behaviors were associated with elevated odds of having sent or showed sexual photos of oneself in the past year among otherwise similar youth. For example, 51% of male youth who sent or showed sexual pictures had also had vaginal sex compared with 13% of males who did not (adjusted odds ratio, 5.6; 95% confidence interval, 3.1–10.1). Thirty-seven percent of younger youth who sent or showed sexual pictures reported having vaginal sex versus 5% of the same-age youth who did not (adjusted odds ratio, 7.7; 95% confidence interval, 3.6–16.3).

For male (Table 3) and older and younger (Table 4) youth, having versus not having concurrent sexual partners during one’s most recent sexual relationship was associated with elevated odds of sending or showing sexual pictures among otherwise demographically similar youth. For male and female youth (Table 3) as well as older youth (Table 4), the relative odds of sexting also increased incrementally with each additional past-year sexual partner that youth reported, after adjusting for demographic characteristics. Among otherwise demographically similar males, lower odds of sexting were also associated with not knowing their sexual partner’s STI history.

Relations between sharing sexual photos and psychosocial characteristics

Among demographically similar youth, psychosocial problems were indicated more frequently for youth who sent or

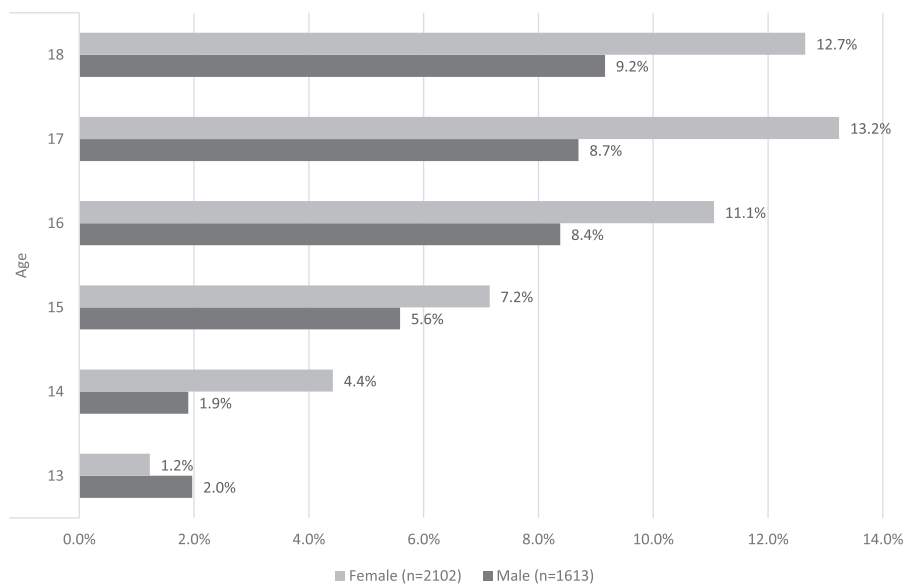


Figure 1. Past-year prevalence rates of sexting (online, via text messaging, and in person) by age for males and females. Males: design-based $F(4.5, 7177.6) = 4.04$, $p = .002$. Females: design-based $F(4.8, 9998.0) = 8.00$, $p < .001$.

showed sexual photos of themselves, compared with youth who did not (Tables 3 and 4). For all youth, high self-esteem was negatively associated, whereas alcohol and marijuana use was positively associated, with having sent or showed sexual pictures. For female youth, depressive symptomatology was additionally associated with elevated odds of having sent or showed sexual pictures of themselves. Similar but nonsignificant trends of depressive symptomatology were also noted for younger youth. Additionally, for younger youth, high social support was associated with decreased odds of having sent or showed sexual photos of themselves.

Discussion

Among 13- to 18-year-olds surveyed in the national Teen Health and Technology Study, sexting is uncommon. Fewer than one in ten youths have sent or shown sexual photos of themselves online, via text messaging, or in person in the past year. Text messaging, is the most common mode used to share sexual photos: half as many report sending or sharing sexual photos online and half as many again in person.

Although perhaps not a new behavior (à la the Polaroid pictures of old), sharing sexual photos is predominately technology

Table 1

A comparison of demographic characteristics based on involvement in sexting (online, via text messaging, and in person) in the past year for male and female youth

Demographic characteristic	Male youth (n = 1,613)		p value	Female youth (n = 2,102)		p value
	No sexting (94%, n = 1,524); % (n)	Sexting (6%, n = 89); % (n)		No sexting (91%, n = 1,924); % (n)	Sexting (9%, n = 178); % (n)	
Age, mean (standard error)	15.4 (.03)	16.3 (.17)	<.001	15.6 (.03)	16.5 (.10)	<.001
Hispanic ethnicity	16.9 (137)	30.5 (17)	.01	17.6 (211)	24.5 (32)	.07
Race			.39			.33
White	72.6 (1,253)	65.6 (66)		66.2 (1,367)	59.7 (115)	
Black/African-American	13.4 (99)	20.1 (11)		14.7 (235)	17.9 (32)	
All other	14.0 (172)	14.3 (12)		19.1 (322)	22.4 (31)	
Lesbian, gay, bisexual or other nonheterosexual identity	3.0 (41)	11.5 (13)	<.001	4.7 (86)	13.9 (26)	<.001
Household income lower than average	27.2 (349)	24.7 (19)	.67	27.4 (455)	32.5 (50)	.20
Region			.02			.42
Urban	27.4 (405)	42.0 (32)		26.2 (530)	29.9 (57)	
Suburban	33.7 (633)	22.0 (28)		30.4 (746)	25.9 (58)	
Small town	38.9 (486)	36.0 (29)		43.4 (648)	44.2 (63)	
Born-again Christian	27.7 (395)	21.5 (16)	.34	28.7 (534)	19.7 (35)	.02
Type of school			.15			.66
Public	85.4 (1,279)	87.1 (78)		87.8 (1,651)	90.8 (161)	
Private	8.5 (157)	7.4 (8)		7.1 (175)	4.9 (10)	
Home schooled	4.9 (74)	1.4 (1)		3.7 (75)	3.6 (6)	
Not in school	1.2 (14)	4.1 (2)		1.5 (23)	.8 (1)	
Caregiver education attainment: high school or less	28.3 (295)	32.4 (18)	.53	29.6 (391)	32.5 (39)	.51

Table 2

A comparison of demographic characteristics based on involvement in sexting (online, via text messaging, and in person) in the past year for younger and older youth

Demographic characteristic	Younger youth (13–15 years old; n = 1,617)			Older youth (16–18 years old; n = 2,098)		
	No sexting (96%, n = 1,555); % (n)	Sexting (4%, n = 62); % (n)	p value	No sexting (89%, n = 1,893); % (n)	Sexting (11%, n = 205); % (n)	p value
Age, mean (standard error)	14.0 (.02)	14.4 (.1)	<.001	17.0 (.02)	17.0 (.07)	.56
Female	46.4 (813)	55.7 (38)	.24	52.7 (1,111)	62.2 (140)	.03
Hispanic ethnicity	17.8 (132)	11.7 (6)	.28	16.7 (216)	31.6 (43)	<.001
Lesbian, gay, bisexual or other nonheterosexual identity	3.0 (48)	15.4 (11)	<.001	4.6 (79)	12.2 (28)	<.001
Race			.85			.08
White	71.5 (1,244)	73.5 (52)		67.5 (1,376)	58.5 (129)	
Black/African-American	13.9 (117)	15.2 (4)		14.2 (217)	19.9 (39)	
All other	14.6 (194)	11.3 (6)		18.3 (300)	21.6 (37)	
Household income lower than average	25.6 (325)	23.9 (16)	.78	28.9 (479)	31.1 (53)	.58
Region			.25			.12
Urban	25.3 (378)	35.3 (17)		28.3 (557)	34.5 (72)	
Suburban	33.0 (652)	24.5 (21)		31.2 (727)	24.3 (65)	
Small town	41.7 (525)	40.2 (24)		40.5 (609)	41.2 (68)	
Born-again Christian	27.5 (410)	28.4 (13)	.91	28.9 (519)	18.0 (38)	.003
Type of school			.71			.64
Public	86.9 (1,310)	90.2 (55)		86.3 (1,620)	89.1 (184)	
Private	7.8 (156)	4.0 (3)		7.8 (176)	6.4 (15)	
Home schooled	5.1 (86)	5.8 (4)		3.5 (63)	1.8 (3)	
Not in school	.2 (3)	.0 (0)		2.4 (34)	2.7 (3)	
Caregiver education attainment: high school or less	27.5 (286)	23.1 (10)	.61	30.3 (400)	35.4 (47)	.23

Table 3

Associations between sexting (online, via text messaging, and in person) and other sexual behaviors and psychosocial indicators for males and females

Youth characteristic	Male youth (n = 1,613)			p value	Female youth (n = 2,102)			p value
	No sexting (94%, n = 1,524)	Sexting (6%, n = 89)	aOR (95% CI)		No sexting (91%, n = 1,924)	Sexting (9%, n = 178)	aOR (95% CI)	
Sexual behaviors (past 12 months)								
Kissed	45.6 (716)	82.0 (71)	5.1 (2.7–9.5)	<.001	45.4 (884)	91.8 (160)	11.0 (6.4–18.9)	<.001
Fondled	27.1 (428)	78.9 (68)	8.3 (4.2–16.4)	<.001	22.7 (462)	83.0 (145)	14.2 (9.1–22.3)	<.001
Oral sex	12.9 (207)	52.0 (45)	5.5 (3.1–9.6)	<.001	11.1 (216)	70.7 (124)	17.5 (11.5–26.6)	<.001
Sex with a finger or toy	11.4 (188)	50.7 (45)	6.6 (3.9–11.0)	<.001	11.7 (230)	69.1 (124)	14.7 (9.7–22.5)	<.001
Vaginal sex	13.0 (199)	51.1 (41)	5.6 (3.1–10.1)	<.001	13.0 (248)	67.0 (115)	11.4 (7.6–17.0)	<.001
Anal sex	2.7 (38)	21.6 (15)	7.5 (2.7–20.4)	<.001	2.1 (38)	25.5 (41)	10.8 (6.1–19.2)	<.001
Risky sexual behaviors ^a								
Use condoms most/all the time	75.1 (166)	63.9 (26)	.6 (.3–1.5)	.30	68.3 (177)	61.0 (65)	.7 (.4–1.2)	.18
Most recent sex partner had an STI								
No	61.9 (142)	76.4 (32)	1.0 (RG)		67.0 (176)	67.1 (79)	1.0 (RG)	
Yes	1.8 (6)	3.9 (3)	2.9 (.6–14.5)	.19	4.5 (10)	5.1 (6)	1.1 (.3–4.6)	.85
Do not know	36.3 (66)	19.7 (10)	.2 (.1–.7)	.01	28.5 (66)	27.8 (31)	1.0 (.5–1.7)	.87
Talked about condoms before having sex with the most recent sex partner	63.9 (144)	63.2 (29)	.9 (.3–2.5)	.87	70.5 (181)	67.4 (76)	.9 (.5–1.5)	.62
Had concurrent sex partners	9.4 (21)	23.4 (8)	3.9 (1.3–11.6)	.01	5.6 (14)	10.6 (15)	1.9 (.8–4.5)	.18
Mean number of sex partners in the past year, mean (SE)	1.9 (.4)	3.5 (1.1)	1.1 (1.0–1.2)	.03	1.4 (.1)	2.8 (.4)	1.4 (1.2–1.6)	<.001
Psychosocial indicators								
Depressive symptomatology ^b								
Nonclinical	96.2 (1,474)	91.0 (81)	1.0 (RG)		94.2 (1,812)	86.3 (157)	1.0 (RG)	
Mild	3.0 (40)	5.0 (4)	1.5 (.5–5.0)	.47	3.6 (68)	8.1 (13)	2.4 (1.2–4.8)	.01
Major	.8 (10)	4.0 (4)	3.6 (.4–34.6)	.26	2.3 (44)	5.6 (8)	1.8 (.6–5.5)	.32
High self-esteem ^b	18.1 (268)	4.4 (5)	.3 (.1–.7)	.005	15.0 (299)	5.2 (9)	.3 (.2–.7)	.003
High social support ^b	10.4 (169)	14.2 (14)	1.4 (.7–2.8)	.28	22.2 (437)	24.6 (42)	1.2 (.8–1.9)	.30
Monthly use of alcohol	8.5 (137)	39.8 (31)	5.4 (3.0–9.5)	<.001	7.7 (146)	20.8 (41)	2.2 (1.4–3.6)	.001
Monthly use of marijuana	5.2 (78)	33.0 (23)	8.7 (4.3–17.3)	<.001	4.2 (79)	13.4 (27)	2.8 (1.6–5.0)	<.001

aOR = Odds Ratio adjusted for demographic characteristics (youth age, biological sex, sexual identity, ethnicity, race, household income, region, born-again Christian, school type, and caregiver educational attainment); CI = confidence interval; RG = reference group; SE = standard error of the mean; STI = sexually transmitted infection.

^a Among the 259 male youth and 368 female youth who reported having vaginal or anal sex.

^b Major depressive symptomatology = five or more symptoms of depression nearly every day for the past 2 weeks, one of which is anhedonia or dysphoria and interference in school work; family relationships; and/or friend relationships; Mild depressive symptomatology = three or more symptoms nearly every day for the past 2 weeks; Nonclinical = all other youth. High self-esteem = a score 1 standard deviation or greater above the sample mean (i.e., 49 and above). High social support = a score 1 standard deviation or greater above the sample mean (i.e., 27 and above).

Table 4

Associations between sexting (online, via text messaging, and in person) and other sexual behaviors and psychosocial indicators for younger and older youth

Youth characteristic	Younger youth (n = 1,617)				Older youth (n = 2,098)			
	No sexting (96%, n = 1,577)	Sexting (4%, n = 63)	aOR (95% CI)	p value	No sexting (89%, n = 1,924)	Sexting (11%, n = 213)	aOR (95% CI)	p value
Sexual behaviors (past 12 months)								
Kissed	34.7 (534)	78.5 (48)	5.3 (2.7–10.4)	<.001	55.9 (1,066)	90.8 (183)	7.9 (4.8–13.0)	<.001
Fondled	13.9 (226)	62.9 (39)	7.7 (4.0–14.7)	<.001	35.5 (664)	87.1 (174)	11.4 (7.3–17.8)	<.001
Oral sex	5.5 (86)	36.6 (21)	7.5 (3.3–17.2)	<.001	18.2 (337)	71.7 (148)	11.2 (7.6–16.5)	<.001
Sex with a finger or toy	5.2 (83)	35.0 (25)	7.5 (3.8–14.9)	<.001	17.7 (335)	70.2 (144)	10.0 (6.9–14.6)	<.001
Vaginal sex	5.3 (74)	36.6 (21)	7.7 (3.6–16.3)	<.001	20.3 (373)	68.2 (135)	8.0 (5.6–11.5)	<.001
Anal sex	1.4 (20)	17.1 (7)	10.1 (2.5–41.2)	.001	3.4 (56)	26.1 (49)	8.3 (5.0–13.7)	<.001
Risky sexual behaviors^a								
Use condoms most/all the time	71.4 (59)	56.7 (10)	.2 (.1–.9)	.03	72.0 (284)	62.9 (81)	.7 (.4–1.2)	.21
Most recent sex partner had an STI								
No	50.9 (48)	73.5 (14)	1.0 (RG)		68.0 (270)	69.8 (97)	1.0 (RG)	
Yes	1.9 (3)	2.7 (1)	1.7 (.2–14.3)	.61	3.4 (13)	5.1 (8)	1.3 (.4–4.1)	.7
Do not know	47.2 (32)	23.8 (7)	.5 (.1–1.8)	.29	28.6 (100)	25.2 (34)	.8 (.5–1.3)	.37
Talked about condoms before having sex with the most recent sex partner	54.8 (49)	50.5 (13)	.6 (.2–2.2)	.48	70.5 (276)	68.6 (92)	1.0 (.6–1.6)	.96
Had concurrent sex partners	11.1 (9)	31.0 (4)	3.7 (.9–15.7)	.07	6.6 (26)	12.4 (19)	2.3 (1.1–4.8)	.03
Mean number of sex partners in the past year, mean (SE)	2.6 (1.0)	3.1 (1.2)	1.0 (1.0–1.1)	.47	1.4 (.1)	3.0 (.5)	1.4 (1.2–1.6)	<.001
Psychosocial indicators								
Depressive symptomatology ^b								
Nonclinical	96.3 (1,496)	89.1 (55)	1.0 (RG)		94.1 (1,790)	87.8 (183)	1.0 (RG)	
Mild	2.6 (40)	6.3 (4)	2.4 (.7–7.8)	.16	3.9 (68)	7.1 (13)	1.7 (.9–3.4)	.11
Major	1.1 (19)	4.6 (3)	4.4 (.7–26.6)	.11	2.0 (35)	5.1 (9)	1.9 (.7–5.3)	.247
High self-esteem ^b	17.8 (261)	.0 (0)	NC		15.4 (306)	6.4 (14)	.4 (.2–.8)	.005
High social support ^b	15.4 (267)	26.2 (16)	1.9 (1.0–3.5)	.04	17.1 (339)	18.7 (40)	1.2 (.8–1.8)	.40
Monthly use of alcohol	3.9 (64)	24.6 (16)	6.1 (2.9–12.9)	<.001	12.2 (219)	29.4 (56)	2.6 (1.8–3.9)	<.001
Monthly use of marijuana	3.0 (47)	27.9 (13)	10.3 (4.4–24.0)	<.001	6.3 (110)	19.0 (37)	3.1 (1.9–5.1)	<.001

aOR = Odds Ratio adjusted for demographic characteristics (youth age, biological sex, sexual identity, ethnicity, race, household income, region, born-again Christian, school type, and caregiver educational attainment); CI = confidence interval; NC = Not calculable; RG = reference group; SE = standard error of the mean; STI = sexually transmitted infection.

^a Among the 105 younger youth and 522 older youth who reported having vaginal or anal sex.

^b Major depressive symptomatology = five or more symptoms of depression nearly every day for the past 2 weeks, one of which is anhedonia or dysphoria and interference in school work; family relationships; and/or friend relationships; Mild depressive symptomatology = three or more symptoms nearly every day for the past 2 weeks; Nonclinical = all other youth. High self-esteem = a score 1 standard deviation or greater above the sample mean (i.e., 49 and above). High social support = a score 1 standard deviation or greater above the sample mean (i.e., 27 and above).

driven for adolescents in today's digital world. Given how uncommon it is to engage in sexting behaviors however, the data suggest that technology access is a less important factor than what is going on in the adolescent's life: Youth who send and show sexual photos of themselves are much more likely to be using substances [26] and less likely to have high self-esteem. They also are much more likely to be engaging in sexual behaviors as well some risky sexual behaviors namely having concurrent sex partners for male youth, as well as older and younger youth, and increasing numbers of past-year sexual partners for male and female youth, as well as older youth. Thus, sexting appears to be related to a more general cluster of behaviors indicative of psychosocial challenge and risky sexual behavior for some youth.

Not all youth who send and share sexual photos are necessarily engaging in problematic behavior. For some teens, taking and sending sexual pictures of themselves plays a role in a healthy sexual relationship. Among a sample of sexting cases brought to police attention, one-third were considered experimental and reflective of sharing images for the purposes of romance or sexual attention seeking [27]. In qualitative work with adolescents, Lenhart et al. [10] noted that many young people talked about sexting as a way to initiate romantic relationships or used in place of having sex. Certainly, from a public health perspective, the risk of STIs is lower for couples who are sharing sexual photos of themselves in place of vaginal or anal sex.

In the present study, almost all youth who share sexual photos of themselves with someone of the same sex self-identify as lesbian, gay, or bisexual. Perhaps LGB youth are sharing sexual photos as a way to create intimacy in the absence of being able to be publicly intimate with their romantic partner. Understanding the motivations behind sexting is critical for parents, teachers, police, and pediatricians who are trying to determine how to handle such situations as they arise. Future research could examine how these findings translate to other minority youth, such as transgender youth, as this is critical to ensure a comprehensive understanding of sexting behavior across adolescents.

Although females are more likely than males and older youth more likely than younger youth to share sexual photos, the profile of psychosocial challenge and sexual risk-taking behavior is remarkably similar for all youth. Thus, although the likelihood of sharing sexual photos varies by biological sex and age, the characteristics of these youth are otherwise similar. Extensive tailoring of prevention efforts does not appear warranted.

Some interesting details about sexting recipients are also noted. Although most youth who share sexual pictures online did so with recipients they knew offline, almost one in three youth share pictures with recipients they know online but not in person. Much of the research attention to date has focused on exchanges between friends or romantic partners [10]. Little is known about the motivations and nuanced experiences of

exchanges between people only known online. Perhaps this is an opportunity for some youth to explore their sexuality in ways that they are not comfortable doing with people they know. Whether this leads to further sexual exploration and perhaps risky sexual behavior offline may be an important future inquiry.

Among youth who shared or sent a picture online, two in five intended recipients are at least 1 year older than the respondent. Of those who report an older recipient, one in five indicates that the person is more than 4 years older. Aggravated sexting incidents involving adults represent an estimated one in three of aggravated cases [27]. Such cases that come to police attention typically involve adult offenders who have developed relationships and seduced victims. Without further information, it is unclear whether the situations in the present study involve criminal elements or not. Age differentials between the sender and recipient seem to be a particularly important aspect of the situation that could contextualize whether the behavior is a marker for greater cause for concern and thus in need of a more systematic intervention. However, the subsamples are not large enough in the present sample to examine this further.

Consensus about the definition and therefore optimal measurement of sexting is lacking. Based on previous work [10], the present study defines the behavior as sending “nude or nearly nude” pictures. This could represent a broad range of behaviors, ranging from being in a revealing bathing suit or shirtless to being completely nude. Mitchell et al. [9] used a similar definition and then asked a follow-up question about whether the picture was sexually explicit (i.e., showing naked breasts, genitals, or bottoms). This narrower definition reduced the rate by more than half: 2.5% of 10- to 17-year-olds endorsed the broader definition, whereas 1% endorsed the narrower definition. Importantly, even with this relatively broad definition, uniformly low rates of sexting are noted across these three national studies.

Limitations

Because the data are cross sectional, directionality cannot be determined. For example, youth may experience depressive symptomatology as a result of this broader pattern of sexual risk behavior or knowing that a sexual picture of them is “out”; or youth with depressive symptomatology may be more inclined to engage in sexting. Also, sexual pictures that include one being “nude or nearly nude” reflect a range of pictures, from youth engaging in sexual acts to adolescent females posing in bathing suits to “flash” the camera [9]. The degree of sexual explicitness in the photos may possibly relate to different odds of negative consequences or harmful impact. Certainly too, sexual behavior can be sensitive to discuss, and youth may under-report their engagement with these behaviors.

Implications

Although the media has portrayed sexting as a problem caused by new technology, parents and health professionals may be more effective by approaching it as an aspect of adolescent sexual development and exploration and, in some cases, risk taking [5]. For youth engaging in risky behaviors across multiple environments, a comprehensive multisystem approach that broadly targets risky behaviors may be more effective than responding to sexting incidents with lectures or punishments. Correspondingly, prevention efforts focusing specifically on

sexting may be less effective than efforts that incorporate information on sexting, such as the potential consequences and risks and how to handle requests for sexual pictures, into established and proven sex education, sexual harassment, and other social/emotional-learning programs [28–30].

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