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Adolescent Sexting, Violence, and Sexual Behaviors: An Analysis of 2014 and 2016 Pennsylvania Youth Risk Behavior Survey Data

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Abstract

BACKGROUND: Sexting is common among adolescents and is associated with numerous health risk behaviors and negative psychosocial constructs. This study examined the relationships between high school students' experiences with sexual violence victimization, dating violence victimization, and engagement in risky sexual behaviors with experiences of receiving sexts.

METHODS: Cross-sectional data from the 2014 to 2016 data from Pennsylvania Youth Risk Behavior. Participants were selected using an independent 2-stage cluster sample design to produce a statewide population-based sample. The pencil and paper surveys were conducted in school. Participants included 6734 Pennsylvania high school students in grades 9–12.

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Conflict of Interest

The authors have no conflict of interest to disclose.

Human Subjects Approval Statement

This activity is considered public health practice and as such sites adhered to local institutional review board policies and procedures.

RESULTS: Overall, 29.0% of Pennsylvania high school students had received a sext, which varied by sex, race/ethnicity, school grade, and sexual identity. Students who engaged in sexual risk behaviors, experienced dating violence, or experienced lifetime sexual violence outside of the dating context had a significantly higher prevalence of receiving a sext than students who did not engage in those behaviors or have those experiences.

CONCLUSIONS: Early screening and prevention efforts that include discussions about sexting behaviors may help prevent other negative outcomes, such as risky sexual behaviors and interpersonal violence. Addressing sexting in the education and health sectors may help to prevent other related harmful health and violence experiences during adolescence.

Keywords

sexting; dating violence; sexual violence; risk behaviors; adolescent health

An estimated 95% of American youth ages 13–17 in the United States have smartphone access, and 45% self-report being online almost constantly. Along with increased internet access, technological interconnectivity has extended the opportunities for engagement in risk behaviors from in-person to online spaces. Sexting is generally defined as "the sending, receiving or forwarding of sexually explicit messages, images, or videos through electronic means." However, the construct of sexting varies by study, with some measurements distinguishing between the mode of distribution, such as sending sexts, receiving sexts, or both. Additionally, the literature differentiates between consensual and nonconsensual sexting, with the latter involving pressure to send a sexually explicit image. Generally, research estimates that 13% to 18.5% of middle and high school students have engaged in sexting. A meta-analysis among youth from various countries aged 11–17 distinguishes between distributing and receiving sexts (14.8% and 27.4% of youth engaged in sexting, respectively).

Researchers have reported positive associations between engagement in sexting and health risk behaviors, sexual risk behaviors, and negative psychosocial functioning. ^{7,8} For example, a literature review found consistent associations between sexting, conceptualized as the sending, receiving, and forwarding of sexually explicit images, and reporting higher scores in measures of depression, anxiety, substance use, and sexual risk-taking among adolescents. ⁴ Another study found that adolescents who sent sexts had an increased likelihood of reporting more sexual partners during the past year than those who did not send sexts. ⁹ Similarly, dating violence victimization and perpetration are positively associated with sexting behaviors among adolescents in cross-sectional studies. ^{10–12}

Parsing out the association between sexting and different violence typologies (eg, sexual violence) is not commonly examined. Most research on adolescent sexting and violence has focused mainly on cyberbullying and dating violence. 10,13 The existing literature examining the relationship between sexting and sexual violence has predominately focused on adult populations, 4,14–16 finding sexting to be positively associated with sexual violence cross-sectionally and longitudinally. 14,16

Given the relationship between sexting and known sexual and dating violence risk factors,⁴ and the inherent sexualized nature of sexting,¹⁷ it is necessary to explore how sexting during adolescence relates to other types of violence, such as sexual violence and dating violence, and risky sexual behaviors. Therefore, this study examines 2014 and 2016 Pennsylvania Youth Risk Behavior Survey (YRBS) data to assess the associations between high school students' experiences with sexual violence, dating violence, and engagement in risky sexual behaviors with sexting experiences (ie, receiving sexts). Pennsylvania is among the top 10 most populated states,¹⁸ and has a sizable proportion of individuals with computer access and internet connectivity, 88% and 81.5%, respectively.¹⁸ Thus, the Pennsylvania YRBS data may contribute to our understanding of the association between sexting with violence and other adverse health behaviors among youth.

METHODS

Sample and Survey Administration

The Youth Risk Behavior Surveillance System (YRBSS) is a system of school-based surveys that includes the national YRBS conducted by the Centers for Disease Control and Prevention (CDC) and separate state, territorial, tribal, and local school-level districts. Surveys are conducted by each jurisdiction's education agency, health agency, or tribal government. Student participation in the YRBS is anonymous and voluntary. Survey participants complete a self-administered pencil and paper questionnaire during a regular class period and recorded their responses on a computer-scannable answer sheet. 19

The national survey does not include questions about sexting behaviors; however, the Pennsylvania YRBS collected data about sexting in the 2014 and 2016 surveys. This study combined 2014 and 2016 Pennsylvania YRBS data to improve statistical power. The Pennsylvania YRBS is conducted biennially and uses an independent 2-stage cluster sample design to produce a sample representative of high school students during each survey year. In 2014, the sample included public, charter, alternative, and vocational school students in grades 9 through 12, and in 2016, the sample included public, charter, and vocational school students in grades 9 through 12. This activity is considered public health practice and as such sites adhered to local institutional review board policies and procedures. During 2014 and 2016, respectively, the number of students in the sample was 2922 and 3812, the school response rates were 80% and 83%, and the student response rates were 80% and 82%. The overall response rates (ie, the product of the school and student response rates) were 64% and 68% which was similar to other states' YRBSs.^{20,21}

Measures

The 2014 and 2016 Pennsylvania YRBS questionnaire asked students to indicate their sex (female or male), grade (9th, 10th, 11th, or 12th), sexual identity (heterosexual, gay or lesbian, bisexual, or not sure), and race/ethnicity. Students were classified into 4 racial/ethnic categories (1) non-Hispanic white (ie, white), (2) non-Hispanic black (ie, black), (3) Hispanic or Latino of any race (ie, Hispanic), and (4) other or non-Hispanic multiple races (ie, American Indian or Alaska Native, Asian, Native Hawaiian or other Pacific Islander, and multiracial), following CDC's preferred terms within a health equity lens. ²⁰ Samples of non-

Hispanic American Indian or Alaska Native, non-Hispanic Native Hawaiian or other Pacific Islander, and non-Hispanic multiracial students were too small for meaningful sub-group analysis; therefore, those data are not presented but remain in the full analytic sample.

Eight questions assessing sexual risk behaviors and experiences with dating violence and sexual violence were examined. Question-wording and analytic coding for each variable are provided in Table 1. Concerning sexting, the variable of interest, students were asked if they had received a text or an email with a revealing or sexual photo of someone during the 30 days before the survey (hereafter "receiving a sext").

Statistical Analysis

A weighting factor was applied to each record to adjust for school and student nonresponse. Missing data were not imputed. All analyses were conducted using SUDAAN statistical software 22 accounting for the weighting and complex survey design. 23 Chi-square tests and t tests were used to examine differences in sexting by demographic characteristics and differences in outcome variables by sex. Logistic regression models—controlling for sex, race/ethnicity, grade, and sexual identity in the overall model, and race/ethnicity, grade, and sexual identity in the models stratified by sex—were used to calculate adjusted prevalence ratios (aPRs). The aPRs examined the association between sexual risk behaviors, experiences with sexual or physical dating violence, and experiences with lifetime sexual violence outside of the dating context and receiving a sext, overall and stratified by sex. Logistic regression models were used to examine the interaction between sex and sexual behavior and violence victimization variables on the sexting variable. For chi-square tests and t tests, we considered differences significant at t < .05. For aPRs, we considered differences significant if 95% confidence intervals (CI) did not include 1.00.

RESULTS

The combined 2014 and 2016 Pennsylvania high school student sample comprised of 3302 (48.9%) female students and 3324 male students. In terms of race/ethnicity, there were 3530 (71.9%) non-Hispanic white students, 828 (14.4%) non-Hispanic black students, 1414 (8.6%) Hispanic students, and 702 (5.2%) students that self-identified as other or multiple races. The racial/ethnic distribution by sex was 1741 (70.6%) non-Hispanic white males and 1782 (73.2%) females, 438 (15.8%) non-Hispanic black males and 389 (13.0%) females, and 701 (8.6%) Hispanic males and 706 (8.5%) females of any racial group. Consistent with sampling procedures, approximately one-fourth of students were in each grade level from 9th through 12th grade. There was a total of 1779 (26.2%) 9th graders, 1730 (25.3%) 10th graders, 1663 (24.4%) 11th graders, and 1404 (24.0%) 12th graders. Additionally, heterosexual students comprised 5570 (87.8%) of the sample, and the remaining students identified as lesbian, gay, or bisexual (LGB) (593; 8.9%) or were unsure of their sexual identity (246; 3.3%).

Overall, 29.0% of students received a sext during the past 30 days. Sexting varied by sex, race/ethnicity, grade, and sexual identity (Table 2). Specifically, the prevalence of receiving a sext was higher among male (31.4%; 95% CI, 28.8–34.2) than female (26.5%; 95% CI, 24.4–28.6; P = .001) students; non-Hispanic black (35.4%; 95% CI, 30.6–40.6, P < .01)

and Hispanic (32.7%; 95% CI, 28.8–36.8, P < .05) than non-Hispanic white (27.3%; 95% CI, 25.3–29.5) students; 10th (29.2%; 95% CI, 25.9–32.8, P < .05), 11^{th} (30.8%; 95% CI, 27.2–34.5, P < .05), and 12th (31.5%; 95% CI, 28.2–35.0; P < .01) grade students than 9th (24.5%; 95% CI, 21.5–27.8) grade students; and LGB (41.8%; 95% CI, 35.7–48.3; P < .001) students than heterosexual (27.8%; 95% CI, 25.8–29.8) students.

Overall, 37.0% (95% CI, 34.4–39.6) of students ever had sexual intercourse; 3.7% (95% CI, 3.1–4.5) were less than age 13 at first sexual intercourse, and 9.5% (95% CI, 8.3–11.0) had 4 or more lifetime sexual partners (Table 3). More than one-fourth (26.9%; 95% CI, 24.6–29.4) of students were currently sexually active, and among those students, 17.5% (95% CI, 14.9–20.4) drank alcohol or used drugs before last sexual intercourse, and 38.7% (95% CI, 35.7–41.8) did not use a condom at last sexual intercourse. Overall, 4.0% (95% CI, 3.3–4.8) of students experienced physical dating violence only, 4.7% (95% CI, 3.9–5.7) sexual dating violence only, 2.7% (95% CI, 2.1–3.6) both physical and sexual dating violence, and the remaining 88.6% (95% CI, 87.1–89.9) experienced neither form of violence. About 1 in 12 students (7.6%; 95% CI, 6.7–8.5) had ever been physically forced to have sexual intercourse. Except for being currently sexually active, the prevalence of these behaviors and experiences was significantly different between female and male students (*P* s < .05).

Students who engaged in sexual risk behaviors, experienced sexual dating violence and physical dating violence, and experienced lifetime sexual violence outside of the dating context had a higher prevalence ratio of sexting than those who had not engaged in those behaviors or had those experiences.

The aPRs ranged from 1.36 to 2.52 among all students, 1.38 to 2.88 among male students, and 1.30 to 2.17 among female students (Table 4). The associations between ever having had sexual intercourse (95% CI, 2.27–2.80; P<.05), having 4 or more lifetime sexual partners (95% CI, 2.10–2.77; P<.05), and being currently sexually active (95% CI, 2.02–2.47; P<.05) and sexting varied significantly by sex, with male students reporting higher prevalence of ever having sexual intercourse, having more than 4 lifetime partners, and being currently sexually active than females.

DISCUSSION

Given increased technology use among youth, interpersonal communication has expanded from in-person modalities to online spaces, which has created additional opportunities for risk behaviors to emerge, as is evident by the increasing trend of youth engaging in sexting. This exploratory study examined youth sexting experiences, specifically the receipt of sexts, and found significant differences in sexting across Pennsylvania high school students by sex, race/ethnicity, grade, and sexual identity. Of note, a higher percentage of youth who self-identified as male, non-Hispanic black, Hispanic, and LGB had received a sext than those who self-identified as female, non-Hispanic white, and heterosexual.

Findings support sex-differentiated experiences of receiving sexts which could inform sexdifferentiated dating and sexual violence interventions among adolescents. In this study, we captured sexting through receiving sexual images but did not capture the creation

or dissemination of sexually explicit materials. Thus, our finding that the prevalence of experiencing sexting via receipt of sexual images was higher among male than female students aligns with other literature.²⁵ Future studies could examine sex differences in receiving only, sending only, or both. Additional research is needed to understand the nuance in how sexting is perceived and its corresponding antecedents and impacts.^{4,26}

The finding that race/ethnicity was associated with receiving sexts is consistent with some previous studies which have found that racial/ethnic minority youth sexted at higher rates;²⁷ however, other studies have reported null effects⁵ or opposite effects in which participants who self-identified as white were more likely to sext.²⁸ There is more consistency across studies that examined sexting among gender and sexual minority youth, with previous studies finding that the prevalence of sexting among gender and sexual minority youth was higher than among their peers.^{5,26} Given the exploratory nature of this study, future studies could use an equity lens to contextualize differential sexting experiences by social identity. These studies could implement culturally sensitive theoretical approaches, like sexual scripts theory, which emphasizes the salience of cultural gender roles in sexual behavior.^{29,30} Additional longitudinal research from middle school through high school may be needed to unpack demographic differences across youth sexting and form predictive models to understand the role of sexting in adolescent romantic and sexual relationship development.

Our study found that the prevalence of receiving sexts was significantly higher among youth who engaged in various risky sexual behaviors, such as first intercourse in early adolescence, increased number of sexual partners, being sexually active, substance use before sexual intercourse, and lack of condom use. These findings are consistent with other studies that found a positive association between sexting and sexual risk-taking and sexting as a precursor to sexual activity.^{27,31–33} The findings of those studies suggest youth engagement in receiving sexts could be a proxy for many other sexually risky behaviors, which can be associated with adverse health outcomes, like sexually transmitted diseases and unintended pregnancies.³⁴ These adverse health outcomes could have cascading effects that impede healthy development and well-being across the life course.^{35–38}

We also found that the prevalence of receiving sexts was significantly higher among those who had experienced dating violence and sexual violence compared to those who had not had such experiences. This finding is consistent with prior research that supports sexting co-occurring with various types of interpersonal violence. ^{16,39–41} This finding highlights the importance of moving away from silos within violence prevention in favor of crosscutting violence prevention efforts. ^{40,42,43} In line with a public health approach to violence prevention and sexual health promotion, a comprehensive approach may include targeting shared risk and protective factors between sexting and dating and sexual violence. ^{39,44,45} One such approach is CDC's Dating Matters® comprehensive teen dating violence prevention model, which has been implemented in middle schools. This violence prevention model is effective in reducing several violence outcomes, including teen dating violence, cyberbullying, and sexual violence, and also addresses sexting. ^{46–48} Further, sexting among youth may also have unintended legal consequences. ^{49,50} Moreover, the U.S. Preventative Services Task Force has recommended screening as a practice to address potential violence among patients, and the American Academy of Family Physicians recommends educating

adolescents on the implications of sexting.^{51,52} Therefore, pediatricians and other health care professionals may screen for sexting and have discussions with parents/guardians and patients about healthy sexual behaviors and relationships.

Limitations

This study contributes to a growing scientific literature; however, there are several study limitations to acknowledge. First, the data are limited to Pennsylvania high school students and cannot be generalized to adolescents nationally. Other considerations include the age of the data. The prevalence of receiving a sext might have changed over time. Also, data were collected prior to the COVID-19 pandemic, which could have impacted online communication practices and sexting prevalence. Future studies may examine consensual and nonconsensual sexting prevalence and their relationship to risk behaviors with a nationally representative sample. However, given that Pennsylvania is among the top 10 most populated states, ¹⁸ this study provides state representative data and contributed to a comprehensive understanding of sexting and other adverse health behaviors among its youth. Second, although our inferential statistic models support a relationship, causality cannot be inferred due to the lack of temporal precedence inherent to the study design. Researchers could implement longitudinal methods to parse out associations between sexting, violence, and sexual health. Third, the extent of student under-reporting or over-reporting of behaviors and experiences cannot be determined. Social desirability or recall bias influenced by the varying recall periods in the questions could have affected self-report. There is the selectivity of recall of specific events that are more easily remembered and possible social desirability of reporting a certain way.⁵³ However, YRBS questions generally demonstrate good test-retest reliability.⁵⁴

IMPLICATIONS FOR SCHOOL HEALTH

Even though sexting is a form of non-contact behavior, the potential downstream consequences of sexting emphasize the importance for professionals in the health and education sector to consider addressing sexting when promoting adolescent sexual health. 31,55 Addressing sexting as part of health promotion is amplified because previous research has found that sexting is a precursor to sexual behaviors among youth. 31 Quality sexual health education in middle and high schools could include sexting within sexual and reproductive health promotion efforts. 31 Within the health sector, clinicians may facilitate and support healthy relationships and responsible use of technology by discussing sexting within the context of sexual relationships with patients. Since this study and others have found that adolescents who engage in sexual activity may be at higher risk for receiving sexts, clinicians and school health professionals may also want to consider screening for sexting behaviors to introduce discussions around puberty and sexual health, which follows recommendations by the American Academy of Family Physicians. 51,56,57

The findings of this study have implications for high school students and their health professionals. Clinician screening and prevention efforts in the education and health sector could focus on sexting during early high school or middle school, before sexting experiences begin, which may help prevent other related harmful health and violence experiences. Health

care professionals informed by clients about sexting involvement could screen for sexual and dating violence to connect youth to supportive services and educate on safe(r) sexual behaviors and associated risks.⁵¹ Additionally, because the prevalence of receiving a sext was higher among students who experienced sexual risk behaviors, sexual or physical dating violence, and sexual violence, discussing sexting in terms of healthy relationships is critical for the prevention of sexual and dating violence.

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REFERENCES

- Anderson M, Jiang J. Teens, Social Media & Technology 2018. Washington, DC: Pew Research Center; 2018.
- 2. Lu Y, Baumler E, Temple JR. Multiple forms of sexting and associations with psychosocial health in early adolescents. Int J Environ Res Public Health. 2021;18(5):1–7.
- 3. Van Ouytsel J, Ponnet K, Walrave M. Cyber dating abuse victimization among secondary school students from a lifestyle-routine activities theory perspective. J Interpers Violence. 2016;33(17):2767–2776. [PubMed: 26872506]
- Gassó AM, Klettke B, Agustina JR, Montiel I. Sexting, mental health, and victimization among adolescents: a literature review. Int J Environ Res Public Health. 2019;16:2364. [PubMed: 31277335]
- 5. Patchin JW, Hinduja S. The nature and extent of sexting among a national sample of middle and high school students in the U.S. Arch Sex Behav. 2019;48(8):2333–2343. [PubMed: 31309428]
- Madigan S, Ly A, Rash CL, Van Ouytsel J, Temple JR. Prevalence of multiple forms of sexting behavior among youth: a systematic review and meta-analysis. JAMA Pediatr. 2018;172:327–335.
 [PubMed: 29482215]
- 7. Frankel AS, Bauerle Bass S, Patterson F, Dai T, Brown D. Sexting, risk behavior, and mental health in adolescents: an examination of 2015 Pennsylvania Youth Risk Behavior Survey Data. J Sch Health. 2018;88(3):190–199. [PubMed: 29399839]
- 8. Kosenko K, Luurs G, Binder AR. Sexting and sexual behavior, 2011–2015: a critical review and meta-analysis of a growing literature. J Comput-Mediat Comm. 2017;22(3):141–160.
- 9. Ybarra ML, Mitchell KJ. "Sexting" and its relation to sexual activity and sexual risk behavior in a national survey of adolescents. J Adolesc Health. 2014;55(6):757–764. [PubMed: 25266148]
- 10. Bianchi D, Morelli M, Nappa MR, Baiocco R, Chirumbolo A. A bad romance: sexting motivations and teen dating violence. J Interpers Violence. 2021;36(13–14):6029–6049. [PubMed: 30537886]
- 11. Dake JA, Price JH, Maziarz L, Ward B. Prevalence and correlates of sexting behavior in adolescents. Am J Sex Educ. 2012;7(1):1–15.
- 12. Van Ouytsel J, Lu Y, Shin Y, Avalos BL, Pettigrew J. Sexting, pressured sexting and associations with dating violence among early adolescents. Comput Hum Behav. 2021;125:106969.
- 13. Drouin M, Ross J, Tobin E. Sexting: a new, digital vehicle for intimate partner aggression? Comput Hum Behav. 2015;50:197–204.
- Dir AL, Riley EN, Cyders MA, Smith GT. Problematic alcohol use and sexting as risk factors for sexual assault among college women. J Am Coll Health. 2018;66(7):553–560. [PubMed: 29405894]
- 15. Florimbio AR, Brem MJ, Grigorian HL, et al. An examination of sexting, sexual violence, and alcohol use among men arrested for domestic violence. Arch Sex Behav. 2019;48(8):2381–2387. [PubMed: 31087197]

16. Titchen KE, Maslyanskaya S, Silver EJ, Coupey SM. Sexting and young adolescents: associations with sexual abuse and intimate partner violence. J Pediatr Adolesc Gynecol. 2019;32(5):481–486. [PubMed: 31330248]

- 17. Jewell JA, Brown CS. Sexting, catcalls, and butt slaps: how gender stereotypes and perceived group norms predict sexualized behavior. Sex Roles. 2013;69(11–12):594–604.
- 18. United States Census Bureau. Quick facts Pennsylvania.
- 19. Brener ND, Kann L, Shanklin S, et al. Methodology of the youth risk behavior surveillance system —2013. Morb Mortal Wkly Rep Recomm Rep. 2013;62(1):1–20.
- 20. Kann L, Olsen EOM, McManus T, et al. Sexual identity, sex of sexual contacts, and health-related behaviors among students in grades 9–12—United States and selected sites, 2015. Morb Mortal Wkly Rep Surveill Summ. 2016;65(9):1–202.
- 21. Kann L, McManus T, Harris WA, et al. Youth risk behavior surveillance—United States, 2017. MMWR Surveill Summ. 2018;67(8):1–114.
- 22. Research Triangle Institute. SUDAAN.
- 23. Centers for Disease Control and Prevention. Software for Analysis of YRBS Data. 2014.
- 24. Van Ouytsel J, Walrave M, De Marez L, et al. Concise report: teenage sexting on the rise? Results of a cohort study using a weighted sample of adolescents. Sex Health. 2020;17(2):178–181. [PubMed: 32164818]
- 25. Reed LA, Boyer MP, Meskunas H, Tolman RM, Ward LM. How do adolescents experience sexting in dating relationships? Motivations to sext and responses to sexting requests from dating partners. Child Youth Serv Rev. 2020;109:104696.
- 26. Wachs S, Wright MF, Gámez-Guadix M, Döring N. How are consensual, non-consensual, and pressured sexting linked to depression and self-harm? The moderating effects of demographic variables. Int J Environ Res Public Health. 2021;18(5):1–16.
- Temple JR, Paul JA, Van Den Berg P, Le VD, McElhany A, Temple BW. Teen sexting and its association with sexual behaviors. Arch Pediatr Adolesc Med. 2012;166(9):828–833. [PubMed: 22751805]
- 28. Mori C, Choi HJ, Temple JR, Madigan S. Patterns of sexting and sexual behaviors in youth: a latent class analysis. J Adolesc. 2021;88:97–106. [PubMed: 33684725]
- 29. Ruvalcaba Y, Stephens DP, Eaton AA, Boyd B. Hispanic women's perceptions of teenage sexting: qualitative analyses using a sexual scripting framework. Cult Health Sex. 2021;23(9):1182–1197. [PubMed: 32706296]
- 30. Simon W, Gagnon JH. Sexual scripts: origins, influences and changes. Qual Sociol. 2003;26(4):491–497.
- 31. Hicks MR, Kernsmith P, Smith-Darden J. Does sexting predict sexual behaviors among adolescents? Gender and race effects. J Adolesc. 2021;93:126–133. [PubMed: 34749166]
- 32. Mori C, Temple JR, Browne D, Madigan S. Association of sexting with sexual behaviors and mental health among adolescents: a systematic review and meta-analysis. JAMA Pediatr. 2019;173(8):770–779. [PubMed: 31206151]
- 33. Rice E, Rhoades H, Winetrobe H, et al. Sexually explicit cell phone messaging associated with sexual risk among adolescents. Pediatrics. 2012;130(4):667–673. [PubMed: 22987882]
- 34. Centers for Disease Control and Prevention. Adolescent and school health. 2021 Available at: https://www.cdc.gov/healthyyouth/sexualbehaviors/index.htm. Accessed July 22, 2022.
- 35. Yazdkhasti M, Pourreza A, Pirak A, Abdi F. Unintended pregnancy and its adverse social and economic consequences on health system: a narrative review article. Iran J Public Health. 2015;44(1):12–21. [PubMed: 26060771]
- 36. Wingood GM, DiClemente RJ, Mikhail I, et al. HIV discrimination and the health of women living with HIV. Women Health. 2007;46(2–3):99–112.
- 37. Kiani MA, Ghazanfarpour M, Saeidi M. Adolescent pregnancy: a health challenge. Int J Pediatr. 2019;7(7):9749–9752.
- 38. World Health Organization. Adolescent pregnancy: issues in adolescent health and development. 2004.

39. Van Ouytsel J, Walrave M, Ponnet K. An exploratory study of sexting behaviors among heterosexual and sexual minority early adolescents. J Adolesc Health. 2019;65(5):621–626. [PubMed: 31473082]

- 40. Wilkins N, Tsao B, Hertz M, Davis R, Klevens J. Connecting the dots: an overview of the links among multiple forms of violence. 2014.
- 41. Wilkins N, Myers L, Kuehl T, Bauman A, Hertz M. Connecting the dots: state health department approaches to addressing shared risk and protective factors across multiple forms of violence. J Public Health Manag Pract. 2018;24:S32–S41. [PubMed: 29189502]
- 42. Decker MR, Wilcox HC, Holliday CN, Webster DW. An integrated public health approach to interpersonal violence and suicide prevention and response. Public Health Rep. 2018;133(1):65S–79S. [PubMed: 30426878]
- 43. Grych J, Swan S. Toward a more comprehensive understanding of interpersonal violence: introduction to the special issue on interconnections among different types of violence. Psychol Violence. 2012;2(2):105–110.
- 44. Finnie RKC, Okasako-Schmucker DL, Buchanan L, et al. Intimate partner and sexual violence prevention among youth: a community guide systematic review. Am J Prev Med. 2022;62(1):e45–e55. [PubMed: 34772564]
- 45. Valido A, Espelage DL, Hong JS, Rivas-Koehl M, Robinson LE. Social-ecological examination of non-consensual sexting perpetration among U.S. adolescents. Int J Environ Res Public Health. 2020;17(24):1–19.
- 46. Niolon PH, Vivolo-Kantor AM, Tracy AJ, et al. An RCT of dating matters: effects on teen dating violence and relationship behaviors. Am J Prev Med. 2019;57(1):13–23. [PubMed: 31128957]
- 47. DeGue S, Niolon PH, Estefan LF, et al. Effects of dating matters[®] on sexual violence and sexual harassment outcomes among middle school youth: a cluster-randomized controlled trial. Prev Sci. 2021;22(2):175–185. [PubMed: 32844328]
- 48. Vivolo-Kantor AM, Niolon PH, Estefan LF, et al. Middle school effects of the dating matters[®] comprehensive teen dating violence prevention model on physical violence, bullying, and cyberbullying: a cluster-randomized controlled trial. Prev Sci. 2021;22(2):151–161. [PubMed: 31833020]
- 49. Krieger MA. Unpacking "sexting": a systematic review of nonconsensual sexting in legal, educational, and psychological literatures. Trauma Violence Abuse. 2016;18(5):593–601. [PubMed: 27436858]
- 50. Lee JR, Darcy KM. Sexting: what's law got to do with it? Arch Sex Behav. 2021;50(2):563–573. [PubMed: 32445133]
- 51. American Academy of Family Physicians. Adolescent health care, sexuality and contraception. 2022. Available at: https://www.aafp.org/about/policies/all/adolescent-sexuality.html.
- 52. US Preventive Services Task Force. Screening for intimate partner violence, elder abuse, and abuse of vulnerable adults: US preventive services task force final recommendation Statement. JAMA. 2018;320(16):1678–1687. [PubMed: 30357305]
- 53. Fadnes LT, Tylleskär T. How to identify information bias due to self-reporting in epidemiological research. Internet J Epidemiol. 2009;7(2):28–38.
- 54. Brener ND, Kann L, McManus T, Kinchen SA, Sundberg EC, Ross JG. Reliability of the 1999 youth risk behavior survey questionnaire. J Adolesc Health. 2002;31(4):336–342. [PubMed: 12359379]
- 55. Steinberg DB, Simon VA, Victor BG, Kernsmith PD, Smith-Darden JP. Onset trajectories of sexting and other sexual behaviors across high school: a longitudinal growth mixture modeling approach. Arch Sex Behav. 2019;48(8):2321–2331. [PubMed: 31214907]
- 56. Huntington C, Rhoades G. Associations of sexting with dating partners with adolescents' romantic relationship behaviors and attitudes. Sex Relatsh Ther. 2021:1–16.
- 57. Rice E, Gibbs J, Winetrobe H, et al. Sexting and sexual behavior among middle school students. Pediatrics. 2014;134(1):e21–e28. [PubMed: 24982103]

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Table 1.

Question Wording and Analytic Coding for Included Sexual Health Risk Behaviors and Experiences, National Youth Risk Behavior Survey, Pennsylvania, 2014 and 2016

Variable	Question	Response Options and Analytic Coding
Experienced sexting	During the past 30 days, have you received a text or an email with a revealing or sexual photo of someone?	Yes vs No
Ever had sexual intercourse	Have you ever had sexual intercourse?	Yes vs No
< 13 years of age at first sexual intercourse	How old were you when you had sexual intercourse for the first time?	11 years or 12 years vs I have never had sexual intercourse and 13years
4 lifetime sexual partners	During your life, with how many people have you had sexual intercourse?	4 people vs. I have never had sexual intercourse or 1,2, or 3people
Currently sexually active	During the past 3 months, with how many people did you have sexual intercourse?	I person vs I have never had sexual intercourse and I have had sexual intercourse, but not during the past 3 months
Dranka Icohol or used drugs before last sexual intercourse	Did you drink alcohol or use drugs before you had sexual intercourse the last time? (among currently sexually active students)	Yes vs No
Did not use a condom at last sexual intercourse	The last time you had sexual intercourse, did you or your partner use a condom? (among currently sexually active students)	Yes vs No
Physically forced to have sexual intercourse	Sexual violence Have you ever been physically forced to have sexual intercourse when you did not want to?	Yes vs No
Experienced dating violence	Sexual dating violence During the past 12 months, how many times did someone you were dating or going out with force you to do sexual things that you did not want to do? (Count such things as kissing, touching, or being physically forced to have sexual intercourse) OR Physical dating violence During the past 12 months, how many times did someone you were dating or going out with physically burt you on purpose? (Count such things as being hit, slammed into something, or injured	Among those who did NOT answer I did not date or go out with anyone during the past 12 months: 0 times vs. >1 time Analyzed as: None, physical dating violence only, sexual dating violence only, both physical and sexual dating violence
	physically burt you on purpose? (Count such things as being bit, slammed into something, or injured with an object or weapon)	

Table 2.

Percentage of PA High School Students Who Received a Text or Email With a Revealing or Sexual Photo (Experienced Sexting), *by Demographic Characteristics—Pennsylvania Youth Risk Behavior Survey, 2014 and 2016

Demographic Characteristic	%	95% CI
Total	29.0	27.0-31.0
Sex		
Male	31.4	28.8-34.2
Female †	26.5	24.4–28.6
Race/ethnicity [‡]		
Non-Hispanic white	27.3	25.3-29.5
Non-Hispanic black§	35.4	30.6-40.6
Hispanic §	32.7	28.8-36.8
Grade		
9	24.5	21.5-27.8
10#	29.2	25.9–32.8
11"	30.8	27.2-34.5
12"	31.5	28.2-35.0
Sexual identity		
Heterosexual [¶]	27.8	25.8–29.8
Gay/Lesbian/Bisexual	41.8	35.7–48.3
Not sure ¶	27.5	19.8–36.8

PA, Pennsylvania (n = 6660); CI, confidence interval.

^{*}During the 30 days=before the survey.

 $^{^{\}dagger}$ Significantly different from male students, based on t test analysis (P < .05).

Findings for students of other or multiple races are not presented due to limited interpretability but remain in the analytic sample.

[§] Significantly different from white students, based on t test analysis (P < .05).

Significantly different from 9th grade students, based on t test analysis (P < .05).

 $[\]P_{\text{Significantly different from gay/lesbian/bisexual students, based on } t \text{ test analysis } (P < .05).$

Table 3.

Percentage of PA High School Students Who Engaged in Sexual Risk Behaviors and Experienced Dating Violence Victimization and Forced Sexual Intercourse, by Sex—Pennsylvania Youth Risk Behavior Survey, 2014 and 2016

	Total	Total $(n = 6660)$		Males	Ξ.	Females	7. N
Sexual Kisk Benaviors and Daung Violence and Sexual Violence	%	95% CI	%	65% CI	%	95% CI	Cni-Square p-value
Sexual behaviors							
Ever had sexual intercourse	37.0	34.4–39.6 38.4	38.4	35.5-41.4 35.5	35.5	32.7–38.5	<.05
< 13 years of age at first sexual intercourse	3.7	3.1–4.5	5.3	4.3–6.5	2.2	1.5-3.1	<.0001
4 lifetime sexual partners	9.5	8.3-11.0	11.9	10.0-14.0	7.2	6.0–8.7	<.0001
Currently sexually active *	26.9	24.6–29.4	26.6	23.8–29.5	27.2	24.6–30.0	.6550
Drankalcohol or used drugs before last sexual intercourse $^{\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!$	17.5	14.9–20.4	20.6	16.7–25.2	14.0	11.1–17.5	<.01
Did not use a condom at last sexual intercourse $^{\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!$	38.7	35.7–41.8	32.9	28.2–38.1	44.1	40.1–48.1	<.01
Experienced dating violence during the past 12 months \sharp							
None	88.6	87.1-89.9	93.9	92.1–95.3	83.3	80.9-85.4	<.0001
Physical dating violence only	4.0	3.3-4.8	3.0	2.1–4.1	5.0	4.0-6.3	
Sexual dating violence only	4.7	3.9–5.7	1.4	1.0-2.0	8.1	8.6-2.9	
Both physical and sexual dating violence	2.7	2.1–3.6	1.8	1.1–2.9	3.6	2.6-5.0	
Sexual violence lifetime							
Physically forced to have sexual intercourse §	7.6	6.7-8.5	4.0	3.2–5.1	11.2	9.8-12.8	<.0001

CI, confidence interval.

 $[\]stackrel{*}{\ast}$ Had sexual intercourse with at least 1 person, during the 3 months before the survey.

 $^{^{\$}}$ When they did not want to.

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Table 4.

Risk of Sexting, by Sexual Behaviors and Experiences with Dating Violence and Sexual Violence—Pennsylvania Youth Risk Behavior Survey, 2014 and

	Received a	Received a text or email with a revealing or sexual photo (experienced sexting)	in a reveal	ng or sexual pn	oro (cyberier	(Greens man)
1	L	Total	2	Males	Fe	Females
ı	aPR‡§	95% CI	aPR‡§	95% CI	aPR#§	95% CI
Sexual risk behaviors						
Ever had sexual intercourse	2.52*	2.27–2.80	2.88	2.46–3.38	2.17	1.82–2.58
< 13 years of age at first sexual intercourse	2.09	1.77–2.47	2.09	1.70-2.56	2.02	1.45–2.81
4 lifetime sexual partners	2.41 *	2.10–2.77	2.60	2.25-3.01	2.11	1.66-2.68
Currently sexually active#	2.23*	2.02–2.47	2.51	2.17–2.90	1.95	1.63–2.34
Alcohol or drug use before last sexual intercourse $I\!\!I$	1.54	1.36–1.73	1.51	1.31–1.75	1.58	1.29-1.93
No condom use during last sexual intercourse \P	1.36	1.20-1.53	1.38	1.18-1.61	1.33	1.10-1.62
Experienced dating violence in the past 12 months#						
None	Ref	I	Ref	I	Ref	I
Physical dating violence only	1.80	1.46–2.22	1.74	1.36–2.23	1.88	1.40-2.51
Sexual dating violence only	1.41	1.17–1.70	1.99	1.45–2.75	1.30	1.02 - 1.66
Both physical and sexual dating violence	2.24	1.92-2.60	2.58	2.19–3.04	2.17	1.72–2.73
Sexual violence (lifetime)						
Physically forced to have sexual intercourse ††	1.85	1.60-2.13	1.75	1.40-2.17	1.94	1.60-2.35

CI, confidence interval.

 $[\]stackrel{*}{\operatorname{Significant}}$ interaction with sex and risk behavior.

 $[\]vec{\tau}_{\rm During}$ the 30 days before the survey.

 $^{^{\}not \perp}$ Adjusted prevalence ratio.

 $^{^{\}mbox{\it S}}$ Models adjusted for sex (in overall model), race/ethnicity, grade, and sexual identity.

[/]Had sexual intercourse with at least 1 person, during the 3 months before the survey.

Among students who dated during the 12 months prior to the survey.

Among students who dated during the 12 months $^{\uparrow\uparrow}$ When they did not want to.

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