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## Cyber Sexual Harassment: Prevalence and association with substance use, poor mental health, and STI history among sexually active adolescent girls

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### Abstract

**Introduction:** The current study aims to assess the prevalence, perpetrators, and consequences of cyber sexual harassment (CSH) among adolescent females.

**Methods:** Sexually active adolescent females ( $N=159$ ) ages 15-19 were recruited from a health clinic in a low-income, urban area of southeast San Diego County, California to complete a tablet-administered survey that included items on sexual violence and harassment, including CSH. Using logistic regression models, we assessed CSH in relation to substance use, poor mental health outcomes and STI history.

**Results:** Participants were, on average, 17 years of age and half were currently in a relationship. The majority of girls (68%) reported at least one form of CSH, which included receiving unwanted sexual messages/photos (53%), receiving unwanted messages asking them to do something sexual (49%), being pressured to send sexual photos (36%), and having sexual photos shared without permission (6%). Perpetrators included known and unknown males; almost a third (27%) reported perpetration by a relationship partner. In logistic regression models adjusting for race, CSH was associated with: past 30-day alcohol use, drug use (ever), feeling depressed (past 30 days), and feeling anxious (past 30 days) (Odds Ratios ranged: 2.9-7.5). CSH was also associated with past-year suicidal thoughts and STI diagnosis (ever) ( $p<0.05$ , ORs not presented due to small numbers).

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**Conclusions:** Our findings suggest that in some subgroups, CSH appears to be affecting the majority of girls, which is especially concerning given its association with multiple poor health outcomes.

### Keywords

cyber sexual harassment; technology facilitated sexual harassment; sexual harassment; digital abuse; sexual violence

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## INTRODUCTION

In the United States, adolescent and young adult females between the ages of 16-24 experience the highest rates of sexual violence and harassment, which have well-documented associations with substance use, as well as poor mental health and sexual health outcomes, including sexually transmitted infections (STIs) (Silverman et al., 2006; Mitchell, Ybarra, & Korchmaros, 2014; Turner, Finkelhor, Hamby, Shattuck, & Ormrod, 2011; Finkelhor, Shattuck, Turner, & Hamby, 2014; Fairchild & Rudman, 2008). A large nationally-conducted study among students in grades 7-12 examining the prevalence of sexual harassment experienced within the past year found that more than half (52%) of girls reported being sexually harassed (Hill & Kearl, 2011). While sexual harassment has been most commonly reported to occur at school and in girls' neighborhoods (Reed et al., 2019; Dahlgvist, Landstedt, Young, & Gådin, 2016; Chiodo, Wolfe, Crooks, Hughes, & Jaffe, 2009; Bucchianeri, Eisenberg, Wall, Piran, & Neumark-Sztainer, 2014), recent research has also identified social networking sites (e.g., Facebook, Instagram, Snapchat) and text messaging as additional venues in which sexual harassment is experienced by girls (Englander, 2015; Stonard, Bowen, Walker, & Price, 2017; Stonard, Bowen, Lawrence, & Price, 2014; Mitchell, Finkelhor, & Wolak, 2007; Henry, & Powell, 2018). Sexual harassment experienced over digital mediums, which we refer to as cyber sexual harassment (CSH), is of particular concern among adolescents given high rates of text messaging and use of social networking sites among young populations (Anderson & Jiang, 2018). An estimated 95% of US adolescents own or have access to a smartphone, and almost half (45%) report being online on a near-constant basis (Anderson & Jiang, 2018).

Across studies, CSH has included the following types of experiences: 1) receiving unwanted sexual photos/messages, 2) having sexual photos/messages shared without permission, 3) unwanted requests for (or pressure to send) sexual photos/messages, and 4) unwanted solicitation to do something sexual (Henry, & Powell, 2018). While many studies have included some of the above CSH types, few studies have captured all of these types of CSH incidents (Henry, & Powell, 2018). The most commonly used measures, particularly in national studies, have asked about unwanted requests to talk online about sex or for sexual information and unwanted requests to do something sexual (Henry, & Powell, 2018). Thus, the prevalence of experiencing CSH has varied widely across studies (from 1% to 59%) largely due to variations in measures used and types of CSH assessed (Henry, & Powell, 2018; Finn, 2004). Studies have found that adolescent females report higher levels of most forms of CSH compared to their male counterparts (Wood, Barter, Stanley, Aghtaie, & Larkins, 2015; Mishna, Cook, Gadalla, Daciuk, & Solomon, 2010; Henry & Powell, 2015).

While CSH is of increasing concern, particularly among adolescent girls, little is known regarding the prevalence of experiencing these *multiple* types of CSH (Henry & Powell, 2018).

Furthermore, while previous national samples in the US have measured CSH among girls (prevalence <20% in these studies) (Mitchell, Jones, Finkelhor, & Wolak, 2013; Mitchell, Finkelhor, Wolak, Ybarra, & Turner, 2011; Ybarra, Mitchell, & Korchmaros, 2011), the prevalence may be greater in communities or among subgroups of the population (e.g. low-income communities, clinic populations of sexually active girls seeking STI or pregnancy testing) experiencing high levels of other forms of sexual violence that likely intersect with CSH (Henry & Powell, 2018). Multiple studies have documented that sexual violence and community violence are high and often intersect within many low-income, urban neighborhoods (Smith et al., 2014; Popkin et al., 2010; Bureau of Justice Statistics, 2017; Reed, Silverman, Raj, Decker, & Miller, 2011). A recent study with sexually active adolescent girls recruited from a low-income community in southern California found that over 65% of girls experienced in-person sexual harassment in the previous 6 months (Reed et al., 2019), which is substantially higher than national data (national studies reported that 52% of girls experienced sexual harassment in the prior year). While such findings indicate that in certain contexts (e.g. low-income neighborhoods), in-person sexual harassment is being reported in high proportions among girls, little is known regarding the prevalence and consequences of sexual harassment experienced online or via other digital platforms across diverse populations of adolescent girls. . Documenting the prevalence and health correlates of CSH is of particular significance within populations who may be at greatest risk for CSH (e.g. populations who have been found to be at higher risk for other forms of sexual violence, such as girls residing in low-income communities or clinic populations of sexually active girls seeking STI or pregnancy testing).

Using electronic communication may increase social connections and reduce geographic barriers, which likely means that the perpetrators of CSH may vary considerably (Henry, & Powell, 2015). While there have been a number of studies on digital dating abuse that have captured elements of CSH perpetrated by dating partners (Zweig, Lachman, Yahner, & Dank, 2014; Kernsmith, Victor, & Smith-Darden, 2018), less has been studied to understand the broad range of other perpetrators and forms of CSH against adolescent girls (Englander, 2015; Henry, & Powell, 2018). Limited prior work has identified that, in addition to experiencing CSH from dating partners, adolescent females report experiencing CSH from friends as well as males met online (Henry, & Powell, 2018). The prevalence of CSH reported to be perpetrated by dating partners versus individuals outside of dating relationships is not well-studied.

The health consequences of CSH also remain understudied. We identified only one study, which found an association between unwanted online sexual solicitation and depressive symptoms among girls (Zetterström Dahlqvist, & Gillander Gådin, 2018). Thus, given the limited research available, more work is needed to understand CSH in relation to girls' health and well-being.. The outcomes related to CSH may be similar to those observed from experiencing offline sexual harassment/coercion and other types of cyber aggression (e.g., bullying and aggression carried out via digital mediums). Experiencing sexual harassment

off-line has been linked to substance use and poor mental health outcomes (Dahlqvist et al., 2016; Chiodo et al., 2009; Bucchianeri et al., 2014), as well as STI and related sexual risk behaviors among adolescent females (Kaltiala-Heino, Savioja, Fröjd, & Marttunen, 2018; Ybarra, Espelage, & Mitchell, 2007). Many forms of sexual victimization can decrease perceptions of control in sexual relationships, including control over decisions to use condoms or other protection against STIs (Teitelman, Bohinski, & Tuttle, 2010). Furthermore, studies on other forms of cyber aggression have documented linkages to depression, anxiety, and suicide (Ybarra et al., 2007; Buchanan, & Mcdougall, 2018). Overall, given the well-documented health consequences of other forms of sexual harassment and victimization as well as cyber aggression, more work is needed to identify the health concerns associated with experiencing CSH among adolescent girls.

Overall, CSH as an emerging form of gender-based violence, with evidence that it is disproportionately affecting girls and women, particularly young populations, and may likely have similar health consequences as other forms of violence against women (e.g. sexual violence, dating violence). However, little is understood regarding the prevalence and perpetrators as well as its relation to potential health-related outcomes. Thus, the primary objectives of the current study were: 1) to describe the prevalence and perpetrators of multiple forms of CSH, and 2) to assess CSH in relation to substance use, poor mental health, and STI among adolescent girls. Our sample included a clinic sample of adolescent girls residing in an urban, low-income San Diego County neighborhood characterized by high rates of sexual violence and other forms of sexual harassment (Jones, 2013; California Criminal Justice Profile, 2010).

## **METHODS**

### **Study Setting and Recruitment**

Data for the current study were collected as part of a cross-sectional study aimed to assess pregnancy and STI risk among adolescent girls (N=159) recruited from a health clinic located in a low-income, urban neighborhood of San Diego County. In order to be eligible for the study, participants were: a) female, b) between the ages of 15-19 years, c) sexually active with a male partner in the past 6 months, and d) English-speaking. Participants were recruited directly through the clinic in one of two ways: 1) direct referral by clinic staff; or 2) approached by research assistants in the clinic waiting room and asked whether they would be interested in participating in a sexual health study. Notably, given that the clinic is located across the street from the local high school, girls who visit the clinic are predominantly attending the high school and from the surrounding community in which the clinic is located.

### **Study Procedure**

Trained research staff implemented informed consent with all participants in a private room. As part of the informed consent process, research staff asked participants questions to make sure that participants understood all aspects of their study involvement and associated risks. For participants under the age of 18, to protect participant confidentiality, parental consent was waived for this sample of girls who were seeking confidential clinic services (e.g.

family planning) at the time of recruitment. After the informed consent process, participants completed a self-guided, tablet-based survey that took approximately 40-60 minutes to complete. The survey collected general information on participants' socio-demographic characteristics (e.g., age, race, ethnicity, country of birth), sexual and reproductive health (e.g., STI history), alcohol/substance use (e.g., lifetime use, use in past 6 months, frequency of use), mental health (e.g., depression, anxiety, suicide ideation), and experiences of violence and harassment (e.g., cyber sexual harassment, sexual coercion/sexual violence, sexual harassment in public, partner violence). Participants received a \$20 gift card for reimbursement of their time. All study protocols were approved by the Institutional Review Board at the University of California, San Diego.

## Measures

**Cyber sexual harassment (CSH):** Four items were used to measure participants' lifetime experiences with CSH perpetrated by males. We developed these items based on our previous qualitative work focused on CSH with this same population (Salazar, Raj, Silverman, Rusch, Zuniga, & Reed, 2015). We also conducted focus groups to pilot the questions with girls prior to survey implementation. Because the study was focused on sexual risk for pregnancy and STI among adolescent females with male partners, the questions pertaining to violence and harassment focused on male perpetration. The current study focused on four types of CSH: a) being pressured to send sexual photos/videos, b) having sexual photos shared without permission, c) receiving unwanted/unsolicited sexual photos/messages, and d) received unwanted emails/messages asking recipient to do something sexual. (See details of the measures in Table 1). Individual types of CSH were assessed and a dichotomous variable representing whether girls reported ever experiencing any type of CSH was also developed.

**Perpetrators of CSH:** Participants were asked to identify their relationship with the perpetrators for each of the 4 CSH items. Response options included: "A boy/man who I..." (1) was dating or in a relationship with, (2) hooked up with, (3) knew but had not dated or hooked up with, (4) met but didn't know that well, (5) liked/had a crush on, (6) did not know, (7) was friends with, or (8) other. Participants had the option of identifying multiple perpetrators for each CSH item as it could have been experienced multiple times from different individuals.

**Alcohol Use:** Two items were used to measure alcohol use. Participants were first asked whether they had consumed alcohol in the past 30 days. Participants who reported past 30-day alcohol use were then asked about past 30-day binge drinking, measured as 5 or more alcoholic drinks in one occasion.

**Marijuana use:** Past 30-day marijuana use was assessed by asking participants whether they had used marijuana within the past 30 days.

**Drug use (excluding marijuana):** Participants were asked whether they had ever used 11 different substances including cocaine, stimulants, and prescription drugs without a prescription. A dichotomous variable was created to represent participants who reported ever

using any of these drugs. (Too few reported past 30 day use of drugs, and thus, our analyses includes a variable for having ever used drugs).

**Mental Health:** Three items were used to assess adverse mental health. Anxiety was measured by a single item asking participants how often they felt worried, tense or anxious in the past 30 days (Spitzer, Kroenke, Williams, & Lowe, 2006). Depression was measured by a single item asking participants how often they felt down, depressed, or hopeless in the past 30 days (Kroenke, Spitzer, & Williams, 2001). Depression and anxiety were both measured using a 1 (*not at all*) to 4 (*nearly every day*) Likert-type scale. Dichotomous variables were developed to indicate experiencing any depression or anxiety in the past 30 days. Suicidal ideation was also measured; participants were asked whether they had considered attempting suicide in the past 12 months (yes/no).

**Sexually Transmitted Infections (STI) history:** Participants were asked to report if they had ever been told by a doctor that they had an STI, including any of the following: chlamydia, gonorrhea, genital herpes, genital warts, HPV, trichomoniasis, and/or crabs. Participants reporting any of these were categorized as having a history of STI.

**Sample Characteristics:** Demographic variables such as age, race, ethnicity, (e.g., identifying as Hispanic/Latina), and living situation (e.g., living with parents) were used to characterize the study sample. We also assessed dating violence and non-partner perpetrated sexual violence as a way to control for other types of violence girls may be experiencing that could be associated with CSH and related health outcomes. Dating violence (lifetime) was measured by combining items on physical violence (2 items) and sexual violence (5 items) perpetrated by a male partner, adapted from the Conflict Tactics Scale. Physical dating violence was measured by asking girls if a male dating partner ever: a) hit, pushed, slapped, choked, or otherwise physically hurt them in any way or b) threatened to hurt them. Sexual dating violence was measured by asking girls if a boy/man they were dating or going out with has ever a) pressured, b) insisted, c) used threats, or d) used force to make them have sex (vaginal, oral, or anal) when they did not want to, or if a male dating partner ever made them do something sexual (other than vaginal, anal, or oral sex) when they did not want to. Non-partner sexual violence was measured using the same items as sexual dating violence, but asked girls about these experiences with non-dating partners.

## Data analysis

Descriptive statistics were used to summarize girls' demographic characteristics, types of CSH, and perpetrators of CSH. T-test, Chi-square and Fisher's Exact tests were used to examine the association between demographic variables and CSH, as well as with each of the potential health correlates (past 30-day alcohol use, drinking 5 or more alcoholic drinks at once in the past 30 days, past 30-day marijuana use, other drug use ever, STI diagnosis ever, feeling depressed in the past 30 days, feeling anxious in the past 30 days, and past-year thoughts of suicide). Crude and adjusted logistic regression/exact conditional logistic regression models were used to examine CSH in relation to each potential health correlate. Due to substantial overlap in reports of different types of CSH among participants, models included a dichotomous measure representing whether girls had *ever* experienced any type



of CSH. Demographic variables associated with dependent variables at  $p < 0.05$  were included in adjusted models. We also considered girls' reports of dating violence and sexual violence perpetrated by a non-dating partner as covariates to ensure that any significant relation between CSH with mental health, substance use, and STI is independent of other forms of violence girls may be experiencing. However, given that adjusting for dating violence or non-partner sexual violence did not change our findings related to CSH and associated health correlates, as well as our small sample size, we did not include these violence variables in our final adjusted model. Findings were presented as odds ratios (ORs) and adjusted odds ratio (aORs) with associated 95% confidence intervals (CIs). All analyses were conducted using SAS® version 9.4.

## RESULTS

### Demographic Characteristics

The average age of participants was 17 years ( $SD = 1.1$ ), and the majority of participants identified as Latina/Hispanic (76.7%). Over three-quarters of participants (77.2%) were born in the United States and (83.5%) reported living with at least one parent (Table 2). There were no significant differences in demographic characteristics between participants who had ever experienced CSH compared to those who had not.

### CSH Types and Perpetrators

The majority of participants (68.6%) reported experiencing at least one form of CSH; 36% reported ever being pressured by males to send sexual photos, 49% received unwanted emails/messages from males asking them to do something sexual, 53% had ever received unwanted sexual messages/photos from males, and 6% reported that their sexual photos were shared by male recipients without permission. There was substantial overlap, where participants who reported one form of CSH often reported experiencing other forms as well. Twenty three percent of the sample reported experiencing only one form of CSH, whereas 45% of the entire sample and 67% of those who reported any CSH reported experiencing more than one form of CSH (data not shown in tables). Perpetrators of CSH were identified as a boy/man they: did not know (41.8%), met but did not know that well (31.6%), knew but did not date or have a relationship with (31.6%), were dating or in a relationship with (26.6%), were friends with (24.1%), hooked up with (19.0%), liked or had a crush on (12.7%). Among those reporting being pressured to send a sexual photo, the most common perpetrators were males that the participants knew or were friends with (51%-59%), followed by males they did not know (49%) and relationship partners (46%). Among those reporting receiving unwanted sexual photos, the most common perpetrators were males that participants did not know (67%), followed by males they knew or were friends with (43%-44%). Among participants reporting that they had sexual photos of themselves shared without permission, the most common perpetrators were male relationship partners (83%) and hook-up partners (67%). Among participants who reported unwanted requests to do something sexual, the most common perpetrators reported were males that participants did not know (62%), followed by males participants knew or had met before (47%) and relationship partners (40%).

## CSH and Health Correlates: Findings from Crude and Adjusted Regression Models

In crude logistic regression models, experiencing any CSH was significantly associated with several substance use variables as well as having ever been diagnosed with an STI.

Compared to participants who did not report CSH, participants who experienced CSH had a greater odds of reporting past 30-day alcohol use (OR=4.8, 95% CI: 2.1-11.3), past 30-day binge drinking (OR=2.8, 95% CI: 1.3-6.1), past 30-day marijuana use (OR=3.2, 95% CI: 1.4-7.3), lifetime drug use (OR=4.7, 95% CI: 1.5-19.2) as well as ever being diagnosed with an STI (OR= 7.3, 95% CI: 1.5-infinity). In multivariate models (adjusted for race), CSH was significantly associated with past 30-day alcohol use (aOR= 4.4, 95% CI: 1.7-11.3) and lifetime drug use (aOR= 3.4, 95% CI: 1.0-14.6). CSH was also significantly associated with STI; however, small numbers prevented us from being able to conduct regression analyses. Among girls reporting CSH, 13% (n=14) reported having an STI, compared to 4% (n=2) among those who did not report CSH (p=0.04). (Table 4).

CSH was also significantly associated with several mental health study variables. Compared to participants who did not report CSH, participants who reported CSH had a higher odds of feeling depressed (past 30 days) (aOR=2.9, 95% CI: 1.3-6.5) and feeling anxious (past 30 days) (aOR=5.3, 95% CI: 2.1-13.0). CSH was also significantly associated with past-year suicidal ideation; descriptive statistics were reported given that the numbers were too small for regression analyses. Among girls reporting CSH, 22% (n=20) reported thoughts of suicide in the past year, compared to 2% (n=1) among those who did not report CSH (p=0.001). (Table 4).

## DISCUSSION

This study examined the prevalence and perpetrators of CSH among adolescent girls and associations with substance use, poor mental health, and STI history. We found that the majority (68%) of girls in our sample reported experiencing some type of CSH in their lifetimes. While only a relatively small proportion (6%) reported having a sexual photo of theirs shared without permission, reports of other types of CSH were extremely common (reported by one-third to over a half of participants). Our study also highlights the multiple perpetrators of CSH, which are known (e.g., relationship partners) and not well-known to participants. Finally, we document the association between CSH and multiple health related correlates, including substance use, poor mental health, and STI.

The majority of girls in our study sample reported having ever experienced CSH, which is higher than most previous studies. Unlike previous national samples that have found a lower prevalence (<20%) of various types of CSH among girls (Mitchell, Jones, Finkelhor, & Wolak, 2013; Mitchell, Finkelhor, Wolak, Ybarra, & Turner, 2011; Ybarra, Mitchell, & Korchmaros, 2011), our study, found much higher frequencies of CSH reported by girls, with the majority reporting to experience at least one type of CSH. This is partly due to our inclusion of multiple CSH items, compared to many previous studies that have focused on only a few types of CSH. While unwanted requests *to talk* about sex and unwanted requests for *sexual information* are measured in most previous CSH studies as a way to capture a broad range of scenarios (Buchanan & McDougall, 2018; Mitchell, Jones, Finkelhor, & Wolak, 2013; Chang, Chiu, Miao, Chen, Lee, & Chiang, 2016), our study measured being



*pressured to send sexual messages/photos, unwanted sexual solicitation, and receipt of unwanted or unsolicited sexual messages/photos*, - all of which were reported in high proportions and may be more specifically capturing scenarios that adolescents are experiencing, resulting in higher proportions reporting CSH. Few previous studies have assessed receiving unwanted sexual photos/messages or having sexual messages/photos shared without permission (Jones, Mitchell, & Finkelhor, 2011; Priebe & Svedin, 2012; Helweg-Larsen, Schütt, & Larsen, 2012).

The high prevalence of CSH reported in our study may also be a result of our focus on a “high risk” population of sexually active girls, drawn from an adolescent health clinic in a low-income, urban neighborhood by the US-Mexico border. The high proportion of CSH reported in our study is aligned with previous findings that young women living in low-income, urban neighborhoods may be at especially high risk for experiencing sexual violence and harassment (Smith et al., 2014; Popkin et al., 2010; Briggs et al. 2010). Our study builds on this previous work by suggesting that girls in low-income, urban neighborhoods not only experience high levels of sexual harassment in their neighborhood, but may experience high levels of sexual harassment via digital mediums as well. Such findings suggest that structural and social environments may play a role in high rates of sexual harassment in these contexts. Notably, high rates of partner and sexual violence as well as sexual harassment have been reported in this region and often intersect (Jones, 2013; California Criminal Justice Profile, 2010). Assessment of CSH and its associated health consequences is particularly important in this population in which the majority of adolescent girls are experiencing CSH. This study was conducted among a predominantly Latina population of adolescent girls; studies have shown that experiencing sexual violence, including sexual harassment, occurs across all race/ethnicities. However, perpetration of such violence has been shown to be greater within social contexts supportive of traditional gender norms that promote male dominance and the sexual objectification of women and girls (Reed et al., 2011). The perpetration of CSH may also occur in high proportions among populations where traditional gender norms are encouraged, including in communities where Latino cultural norms may be supportive of machismo and the sexual prowess of males (Harway & Steel, 2015). Overall, the prevalence of CSH in previous research has varied substantially, largely due to a wide range of CSH measures, assessment limited to certain types of CSH, and the varying populations and age ranges sampled across studies (Henry, & Powell, 2018). Future research will be needed that adapts comprehensive and consistent measures to permit comparison of the prevalence of CSH across different populations and research studies. Without consistent measures across studies, it is not possible to compare the CSH prevalence across groups with accuracy. In addition, study findings indicate the need to further investigate which subgroups may be experiencing especially high rates of CSH and association with poor health correlates.

New to the literature on CSH, our study highlights the association between CSH and adverse health correlates, including substance use, poor mental health, and STI. Our findings are aligned with the limited prior work that has shown an association between unwanted sexual solicitation and depressive symptoms among girls (Zetterström Dahlqvist, & Gillander Gådin, 2018). Our study builds on this previous work by considering a broader range of CSH types as well as health correlates. Our findings are well-aligned with previous research

on sexual harassment experienced in-person (Dahlqvist et al., 2016; Chiodo et al., 2009; Bucchianeri et al., 2014). Research on sexting has also reported associations with substance use and poor mental health outcomes, as well as sexual risk behaviors for STI (Benotsch, Snipes, Martin, & Bull, 2012; Frankel, Bass, Patterson, Dai, & Brown, 2018). Some of the studies on sexting have highlighted a substantial amount of “non-consensual sexting,” which refers to incidents where sexual photos/messages were shared without permission (Madigan, Ly, Rash, Van Ouytsel, & Temple, 2018). Thus, the association between sexting and poor health outcomes may be due, in part, to a large proportion of sexting that is non-consensual (a form of CSH). In addition, given that over a third of our participants reported being pressured into sexting, future studies on sexting likely need to consider being pressured to sext as another form of non-consensual sexting and CSH. Overall, our findings suggest that CSH is associated with adverse health correlates that are similar to other forms of sexual violence. However, the effects of CSH may be particularly concerning given that it appears to be occurring in much higher proportions, with the majority of girls reporting CSH within this population of sexually-active adolescents.

While decades of research studies have measured in-person experiences of sexual harassment, CSH is a new and emerging threat, often involving different scenarios and perpetrators. Beyond the literature on digital dating abuse, which captures some elements of CSH perpetrated specifically by relationship partners, there are few studies that have assessed the diverse perpetrators of CSH (Henry & Powell, 2015; Powell & Henry, 2016). This previous but limited work suggests that CSH and other forms of online harassment is perpetrated not only by those known to the victim, but also by those who are unknown (Henry & Powell, 2015; Powell & Henry, 2016). Similar to previous research on digital dating abuse, our study reports the high prevalence (one-third) of participants reporting CSH perpetration by relationship partners. In terms of improving our understanding of CSH perpetration, future work may be helpful to assess whether girls are more likely to experience CSH from “friends” met online versus those with face-to-face contact. Future studies with larger samples will also be needed to better understand any differences in health consequences of CSH by type of perpetrator (e.g., relationship partner, friend, someone unknown to the victim).

These findings should be interpreted in light of several limitations. Our data rely on self-reported responses and thus, CSH as well as other items that may be considered stigmatizing (e.g., STI, mental health concerns, alcohol or drug use) may be underreported (Harrington et al., 2001). Despite this limitation, a high prevalence of CSH as well as other items that may be stigmatizing (e.g. substance use) were observed. While we only had single item measures for items representing mental health concerns, we were still able to capture substantial proportions of girls reporting these. Additionally, prior studies on sensitive topics have found that computer-assisted survey technologies have improved reliability and accuracy in self-reported data collection (Ghanem, Hutton, Zenilman, Zimba, & Erbeling, 2005). Furthermore, in addition to underreporting, because our analyses were limited to 159 participants, we had limited statistical power; yet we found strong evidence of an association between CSH and multiple health correlates. In our study, girls experiencing one form of CSH were likely to report others, thus, future studies with larger sample sizes are needed to assess unique effects of various forms of CSH, including distinct effects based on perpetrator

type, on health related outcomes (e.g. mental health, STI, pregnancy). Some forms of CSH may also increase girls' risk for in-person sexual victimization as well as other distinct health or behavioral risks. Future prospective study will also be needed to establish temporality of associations, which our cross-sectional study could not provide. Furthermore, our sample of adolescent girls was restricted to sexually active females who reported male partners and the clinic for this study was within a single urban metropolitan area that primarily serves clients from low income communities; thus, findings are most generalizable to similar populations.

In summary, our findings suggest that in this population of sexually active adolescents, CSH is common, perpetrated by males known and unknown to girls, including relationship partners, and is associated with multiple poor health correlates. Future CSH research will require the use of consistent and comprehensive measures that, in the least, include these main categories: a) being pressured to send sexual photos/videos, b) having sexual photos shared without permission, c) receiving unwanted sexual photos/messages, and/or d) being solicited online or via text to do something sexual. Furthermore, given the substantial proportion of participants being pressured into sexting and/or reporting having a sexual photo shared by someone else without permission, future research on sexting may need to consider these types of scenarios, especially when assessing potential health outcomes related to sexting. Our study highlights that among some subgroups of the population, CSH may be occurring in such high proportions that it may have become the norm for girls (as well as for those perpetrating this behavior). Thus, in social contexts where CSH is occurring in such high proportions, more work may be needed to identify prevention approaches that interrupt attitudes towards CSH as a normative behavior. Overall, the rapid uptake of electronic communication technology among youth in the U.S. may expand the ways in which adolescent girls experience sexual harassment and have detrimental effects on their health and well-being. Future research and programmatic efforts are needed that recognize CSH as a form of sexual violence with similar threats to physical and mental health. Notably, much of the focus in the field has been on sexual violence defined as forced sexual intercourse; however, our findings related to CSH and associated health correlates suggest that girls are experiencing a diverse set of sexual abuses that are affecting their health and well-being. The health impact of CSH is especially concerning given that the majority of girls reported experiencing CSH from our clinic-based sample. Thus, findings also suggest that adolescent clinic settings may be ideal to screen for CSH as well as to provide information/education materials and related services for girls who have experienced CSH – and who may be experiencing associated health outcomes.

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**Table 1.**

Cyber Sexual Harassment Measures Used

Cyber Sexual Harassment Type	Measure Used
Being pressured to send sexual photos/videos	Has a boy/man sent you a message or email asking you to send them a sexually explicit photo/video of yourself? If yes, then participant was asked: When a boy/man sent you a message or email asking you to send them a sexually explicit photo/video of yourself, did they ever try to pressure you to do it (for example, did they keep asking after you said no, or make you feel like you had to do it by sending you a photo of them first)?
Having sexual photos shared without permission	Have you ever sent any sexually explicit photos or videos of yourself to a boy or has a boy/man ever taken any sexually explicit photos or videos of you? By sexually explicit we mean photos of yourself or with others that are sexual in nature, or revealing parts or all of your body. If yes, then participant was asked: During any of the times you sent a sexually explicit photo/video or a boy/man took sexually explicit photos or videos of you, did any boys/men ever do any of the following: a) Show these photos to anyone else when you did not want them to or told them not to b) Send the photo to friends or other people in your school by email or a message when you did not want them to or told them not to c) Post it on Facebook, Twitter, Instagram, or another social media outlet, when you did not want them to or told them not to <i>* Participants could check more than one of these three response options, which were combined into one variable representing whether participants had ever experienced having sexual photos shared without permission.</i>
Receiving unwanted/unsolicited sexual photos/messages	Has a boy/man ever sent you unwanted messages or email that had photos of them that were sexually explicit?
Unwanted sexual solicitation	Has a boy/man ever sent you unwanted messages or email asking you to do something sexual with them or saying that they wanted to do something sexual to you (for example: touch you)?

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**Table 2.**Sample characteristics of participants recruited from a clinic setting in Southern California ( $N=159$ )

Characteristics	Total sample ( $N=159$ )  n (%) /m(sd) <sup>x</sup>	Any type of CSH experiences		Chi- square	P-value
		No ( $N=50$ ) n (%) /m(sd)	Yes ( $N=109$ ) n (%) /m(sd)		
Age <sup>a</sup>	17.0 (1.1)	17.1 (1.1)	17.0 (1.1)	0.71 <sup>b</sup>	0.479
Race				0.0002	0.18
White	23 (14.6)	11 (22.0)	12 (11.0)		
Asian	28 (17.6)	7 (14.0)	21 (19.3)		
American Indian/Native Hawaiian	4 (2.5)	2 (4.0)	2 (1.8)		
Black or African American	5 (3.1)	0 (0.0)	5 (4.6)		
Multiracial	13 (8.2)	2 (4.0)	11 (10.1)		
Other <sup>*</sup>	85 (53.4)	28 (56.0)	57 (52.3)		
Latino				1.1	0.29
No	37 (23.3)	9 (18.0)	28 (25.7)		
Yes	122 (76.7)	41 (82.0)	81 (74.3)		
Born in the US				1.1	0.29
No	36 (22.8)	14 (28.0)	22 (20.4)		
Yes	122 (77.2)	36 (72.0)	86 (79.6)		
Lives with at least 1 parent				0.18	0.67
No	26 (16.5)	9 (18.4)	17 (15.6)		
Yes	132 (83.5)	40 (81.6)	92 (84.4)		
Experienced Dating Violence (ever)				10.7	0.001
No	117 (73.6)	46 (90.2)	71 (65.7)		
Yes	42 (26.4)	5 (9.8)	37 (34.2)		
Experienced Non-Partner Sexual Violence				9.7	0.002
No	131(82.4)	49 (96.1)	82 (75.9)		
Yes	28 (17.6)	2 (3.9)	26 (24.1)		

Notes:

<sup>a</sup>: mean and standard deviation is shown for the age, which was examined as a continuous variable.<sup>b</sup>: t -value, using T-test.<sup>x</sup>M (sd) = Mean (standard deviation)<sup>\*</sup> 79 out of 85 of the "other" category were participants who identified as Mexican/Hispanic when asked to write in their response

**Table 3.**

Types of Cyber Sexual Harassment by Male Perpetrator Relationship Characteristics \*

Perpetrator	Experienced any CSH (n=109) n (%)	Pressured by perpetrator to send a sexual photo (n=39) n (%)	Type of CSH		
			Received unwanted sexual messages/photo(s) by perpetrator (n=58) n (%)	Had sexual photos shared by perpetrator without permission (n=6) n (%)	Unwanted sexual solicitation (n=53) n (%)
Male dating/relationship partner	29 (26.6%)	18 (46.1)	14 (24.1)	5 (83.3)	21 (39.6)
Male hook-up partner	21 (19.0%)	13 (33.3)	11 (19.0)	4 (66.7)	15 (28.3)
Male I liked/had a crush on	15 (13.7%)	15 (38.5)	6 (10.3)	2 (33.3)	10 (18.9)
Male friend	26 (24.1%)	20 (51.3)	22 (37.9)	3 (50.0)	19 (35.8)
Male I knew but had not dated	34 (31.6%)	23 (58.9)	25 (43.1)	3 (50.0)	25 (47.2)
Male I met but didn't know well	34 (31.6%)	21 (53.8)	26 (44.8)	2 (33.3)	25 (47.1)
Male I did not know	46 (41.8%)	19 (48.7)	39 (67.2)	1 (16.7)	33 (62.2)
Other **	7 (6.4)	4 (10.3)	2 (3.4)	1 (16.7)	5 (9.4)

\* Percents for each CSH category do not add up to 100 because categories are not mutually exclusive.

\*\* For the "other" perpetrators, ex-boyfriend was most common.

**Table 4:**

Logistic regression analysis of the relation between any type of CSH (exposure) and mental health and substance abuse (outcomes)

Variable	Total sample (n=159)  n (%)	Any type of CSH		Crude Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI)
		No (N=50) n(%)	Yes (N=109) n(%)		
Past 30-days alcohol use					
No	95 (61.7)	41 (83.7)	54 (51.4)	Ref	Ref
Yes	59 (38.3)	8 (16.3)	51 (48.6)	<b>4.8*** (2.1, 11.3)</b>	<b>4.4** (1.7, 11.3)</b>
Past 30-days Binge					
No	92 (61.7)	37 (77.1)	55 (54.5)	Ref	Ref
Yes	57 (38.3)	11 (22.9)	46 (45.5)	<b>2.8** (1.3, 6.1)</b>	2.1 (0.9, 5.0)
Past 30-days marijuana use					
No	101 (65.6)	40 (81.6)	61 (58.1)	Ref	Ref
Yes	53 (34.4)	9 (18.4)	44 (41.9)	<b>3.2** (1.4, 7.3)</b>	2.2 (0.9, 5.5)
Lifetime drug use					
No	120 (77.4)	45 (91.8)	75 (70.7)	Ref	Ref
Yes	35 (22.6)	4 (8.2)	31 (29.3)	<b>4.7<sup>A</sup>** (1.5, 19.2)</b>	<b>3.4<sup>A</sup>* (1.1, 14.6)</b>
Feeling Depressed (past 30 days)					
No	61 (39.9)	29 (60.4)	32 (30.5)	Ref	Ref
Yes	92 (60.1)	19 (39.6)	73 (69.5)	<b>3.5*** (1.7, 7.1)</b>	<b>2.9* (1.3, 6.5)</b>
Feeling anxiety (past 30 days)					
No	40 (26.1)	25 (52.1)	15 (14.3)	Ref	Ref
Yes	113 (73.9)	23 (47.9)	90 (85.7)	<b>6.5**** (3.0, 14.3)</b>	<b>5.3*** (2.1, 13.0)</b>
Thought of suicide (past year)					
No	117 (84.8)	44 (97.8)	73 (78.5)	--	--
Yes	21 (15.2)	1 (2.2)	20 (21.5)	--	--
<b>p=0.04</b>					
STI Ever					
No	141 (89.8)	48 (96.0)	93 (86.9)	--	--
Yes	16 (10.2)	2 (4.0)	14 (13.1)	--	--
<b>p=0.001</b>					

Notes: Adjusted Odds Ratio are adjusted for race.

\* : p<0.05,

\*\* : p<0.01,

\*\*\* : P<0.001,

\*\*\*\* : p<0.0001

<sup>A</sup> Exact Odds Ratios were used due to sample sizes <5 in at least one cell

The sum of column 3 and 4 is not equal to column 2 because of the missing values.

-- Numbers were too small to report accurate results for regression analyses. While still significantly significant, confidence intervals were very large. Instead, p values for the *chi square* are presented.

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