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Social Epidemiology of Early Adolescent Cyberbullying in the United States

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Abstract

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Objective: To determine the prevalence and sociodemographic correlates of cyberbullying victimization and perpetration among a racially/ethnically and socioeconomically diverse population-based sample of 11–12-year-old early adolescents.

Methods: We analyzed cross-sectional data from the Adolescent Brain Cognitive Development (ABCD) Study (Year 2; N=9,429). Multiple logistic regression analyses were used to estimate associations between sociodemographic factors (sex, race/ethnicity, sexual orientation, country of birth, household income, parental education) and adolescent-reported cyberbullying victimization and perpetration.

Results: In the overall sample, lifetime prevalence of cyberbullying victimization was 9.6%, with 65.8% occurring in the past 12 months, while lifetime prevalence of cyberbullying perpetration was 1.1%, with 59.8% occurring in the past 12 months. Boys reported higher odds of cyberbullying perpetration (AOR 1.71, 95% CI 1.01–2.92) but lower odds of cyberbullying victimization (AOR 0.80, 95% CI 0.68–0.94) than girls. Sexual minorities reported 2.83 higher odds of cyberbullying victimization (95% CI 1.69–4.75) than non-sexual minorities. Lower household income was associated with 1.64 (95% CI 1.34–2.00) higher odds of cyberbullying victimization than higher household income, however household income was not associated with cyberbullying perpetration. Total screen time, particularly on the internet and social media, was associated with both cyberbullying victimization and perpetration.

Conclusions: Nearly one in ten early adolescents reported cyberbullying victimization. Pediatricians, parents, teachers, and online platforms can provide education to support victims and prevent perpetration for early adolescents at the highest risk of cyberbullying.

Keywords

Cyberbullying; screen time; social media; pediatrics; adolescents; population groups

Introduction

Screen use among children and adolescents has dramatically increased and transformed over the past few years with new social media and other platforms (e.g., smart phones, gaming consoles, tablets) emerging and gaining popularity,[1,2] leading to more potential exposure to cyberbullying victimization and perpetration. Generally, cyberbullying is the willful and repeated harm by a perpetrator to a victim through the use of computers, cell phones, or other electronic devices.[3] Cyberbullying perpetration is identified as an intention to inflict harm in a repetitive and focused manner upon a less powerful individual.[3] Compared to in-person bullying, cyberbullying can allow users to maintain anonymity, occur outside of educational vicinities, and be more challenging to escape.[3] Cyberbullying is recognized as a serious public health issue affecting children and adolescents, but its prevalence and sociodemographic associations may be changing given recent increases in adolescent screen use and exposures to new forms of digital technologies.[4]

Recognizing the contemporary prevalence of cyberbullying behaviors and associated sociodemographic factors is crucial for implementing preventive measures against downstream consequences such as anxiety and depression, loneliness, and suicidal ideation.[5] Children from lower socioeconomic backgrounds or racial/ethnic minority groups have

demonstrated higher screen time that might facilitate greater exposure to cyberbullying.[6] Among a sample of middle school students in the Los Angeles Unified School District surveyed in 2012, 6.6% reported cyberbullying victimization and 5% reported cyberbullying perpetration.[7] Cyberbullying perpetrators and victims were more likely to report at least 3 hours of internet use per day.[7] Students who texted more than 50 times per day were also more likely to report cyberbullying victimization. Sexual minority adolescents reported double the cyberbullying victimization rates than their non-sexual minority adolescent peers in Los Angeles[7] and Boston.[8] However, the reported percentage of cyberbullying among sexual minority youth has ranged widely, from 10.5% to 71.3%.[9] Findings on sex differences in cyberbullying have been mixed and may depend on age.[10,11] One meta-analysis showed that early to mid-adolescent girls were more likely, whereas late-adolescent girls were less likely, to report cyberbullying (victimization or perpetration) than their male counterparts.[10] This finding is supported in a study on traditional bullying across late childhood and early adolescence, where rates of bullying were more persistent in girls than in boys, but also declined overall across the transition from primary school to secondary school.[12] With respect to race and ethnicity, a prior study of White and Black respondents observed similar cyberbullying victimization and perpetration behaviors.[13] Greater screen use is also associated with more cyberbullying, since cyberbullying requires access to an electronic device.[14,15] However, there is a paucity of data on contemporary cyberbullying prevalence, also considering multiple sociodemographic characteristics, in US early adolescents, when cyberbullying behaviors may begin to develop.[10] Early adolescence is a critical period of development carrying high potential for interventions that target screen behaviors associated with cyberbullying behaviors.[16]

The purpose of the current study was to investigate contemporary cyberbullying behaviors (victimization and perpetration) characterized across a national population-based and demographically diverse sample of US early adolescents aged 10–14 years-old. We considered potential differences in cyberbullying behaviors by sex, sexual orientation, race/ethnicity, and socioeconomic status. We also investigated associations between cyberbullying behaviors and usage of different screen time modalities.

2. Methods

We conducted a secondary cross-sectional analysis of data from the 2-year follow-up of the Adolescent Brain Cognitive Development (ABCD) study (4.0 release). The ABCD study is a longitudinal study (baseline 2016–2018) of health, brain, and cognitive development in 11,875 children from 21 recruitment sites across the U.S. The ABCD study participants, recruitment, protocol, and measures have previously been described in detail.[17] Participants were predominantly 11–12 years old (range 10–14 years) during the 2-year follow-up, which was conducted between 2018–2020. We omitted study participants with missing data for cyberbullying or sociodemographic variables (Supplemental Appendix). After omitting participants with missing data, 9,429 children remained in the analytic sample. Institutional review board (IRB) approval was received from the University of California, San Diego (UCSD) and the respective IRBs of each study site. Written assent was obtained from participants, and written informed consent was obtained from their caregivers.

Measures and Study Variables

Dependent Variables:

Cyberbullying Questionnaire.: Adolescents completed a self-reported questionnaire to capture cyberbullying (victimization and perpetration) based on the validated Cyberbullying Scale.[18] Cyberbullying victimization was assessed with the question, "Have you ever been cyberbullied, where someone was trying on purpose to harm you or be mean to you online, in texts, or group texts, or on social media (like Instagram or Snapchat)?" Cyberbullying perpetration was assessed with the question, "Have you ever cyberbullied someone, where you purposefully tried to harm another person or be mean to them online, in texts or group texts, or on social media (like Instagram or Snapchat)?" For both cyberbullying victimization and perpetration, participants were also asked if this occurred in their lifetime as well as in the past 12 months.

Independent Variables: Parents reported participants' sex at birth (male or female), race/ethnicity (Non-Latino/Hispanic White, Non-Latino/Hispanic Black, Native American, Latino/Hispanic, Asian, or Other), and country of birth (born in U.S. or outside U.S.) at baseline. Additionally, parents reported highest parent education and household income at Year 2. Highest parent education was classified as high school or lower versus college or higher. Household income was grouped into two categories reflecting the U.S. median household income: less than $75,000 and $75,000 or more.[19] Participants reported their own sexual orientation ("Are you gay or bisexual?"; yes, maybe, no, don't understand the question) at Year 0. Responses "yes" and "maybe" were grouped together to represent sexual minority youth.

Screen use for the following modalities was determined using adolescents' self-reported hours of use on a typical weekday and weekend: multi-player gaming, single-player gaming, texting, social media, video chatting, browsing the internet, and watching/streaming movies, videos, or TV.[20] Total typical daily screen use was calculated as the weighted sum ([weekday average × 5] + [weekend average × 2])/7.

Statistical Analyses—Data analyses were performed in 2022 using Stata 15.1 (StataCorp). Multiple logistic regression analyses were conducted to estimate cross-sectional associations between sociodemographic factors (both models included sex, race/ethnicity, sexual orientation, country of birth, household income, parents' highest education) as independent variables and lifetime cyberbullying victimization or perpetration as outcomes, controlling for study site (n = 21). We additionally used multiple logistic regression analyses to estimate associations between screen time and lifetime cyberbullying victimization or perpetration in unadjusted and adjusted models. Both adjusted models controlled for sex, race/ethnicity, sexual orientation, country of birth, household income, parents' highest education, and study site. Propensity weights were applied to match key sociodemographic variables in the ABCD Study to the American Community Survey from the U.S. Census.[21]

Results

Table 1 describes sociodemographic characteristics of the 9,429 participants included. The analytic sample was approximately balanced according to sex (48.6% female) and was racially and ethnically diverse (43.8% racial/ethnic minority). Lifetime prevalence of cyberbullying victimization was 9.6%, with 6.3% reporting victimization in the past 12 months. Lifetime prevalence of cyberbullying perpetration was 1.1%, with 0.7% reporting perpetration in the past 12 months.

Table 2 shows sociodemographic associations with lifetime cyberbullying victimization and perpetration. Boys reported higher odds of cyberbullying perpetration (adjusted odds ratio (AOR) 1.71, 95% confidence interval (CI) 1.01–2.92) but lower odds of cyberbullying victimization (AOR 0.80, 95% CI 0.68–0.94) than girls. There were no significant differences in cyberbullying victimization by race/ethnicity. Native American adolescents reported 4.39 higher odds of cyberbullying perpetration (95% CI 1.32–14.57) than White adolescents. Sexual minority adolescents reported 2.83 higher odds of cyberbullying victimization (95% CI 1.69–4.75) than heterosexual adolescents. Lower household income was associated with 1.64 (95% CI 1.34–2.00) higher odds of cyberbullying victimization than higher household income.

Table 3 shows unadjusted and adjusted associations among screen time and cyberbullying victimization and perpetration. Each additional hour of total screen time was associated with 1.11 (95% CI 1.08–1.14) higher odds cyberbullying victimization and 1.10 (95% CI 1.06–1.14) higher odds of cyberbullying perpetration in adjusted models. The specific screen modalities most strongly associated with cyberbullying victimization and perpetration were the internet and social media.

Discussion

In a demographically diverse, contemporary sample of 11- and 12-year-old early adolescents in the United States, we found that 9.6% reported a lifetime prevalence of cyberbullying victimization, and 1.1% reported lifetime cyberbullying perpetration.

We found sex differences in cyberbullying victimization and perpetration in this early adolescent sample, with girls reporting more cyberbullying victimization than boys, consistent with a prior meta-analysis.[10] In contrast, boys reported more cyberbullying perpetration than girls, which is consistent with gender differences in general bullying,[22] but opposite to findings of the prior cyberbullying meta-analysis, although these differences may be due to sampling, age, or technology use differences.[10] While speculative, males' higher prevalence of cyberbullying perpetration may partially be explained by greater aggression or materialism, a cluster of goals and values focused on possessions, wealth, image, and status.[10,23] Verbal anger and aggression are explanatory factors for traditional and cyberbullying perpetration such that perpetration is associated with increased aggression.[24] Conversely, less aggression makes adolescents easier targets for bullying because it guarantees more anonymity for the bullying perpetrator.[24] One study also found that materialism was associated with cyberbullying in boys but not girls.[23]

The higher rates of victimization among sexual minorities are consistent with prior studies showing that sexual minority youth are at increased risk of victimization through cyber and non-cyberbullying,[8,9,25,26] although it is worth noting that 25% of respondents did not understand the question about sexual orientation. Future research in the ABCD Study could track this relationship as the participants progress across adolescence. Furthermore, cyberbullying victimization in sexual minority youth is associated with higher mental health problems; parental support can protect against mental health problems while non-supportive parents may exacerbate harms.[27]

We did not find significant differences in cyberbullying victimization by race/ethnicity in this early adolescent sample, indicating that early adolescents are susceptible to cyberbullying victimization regardless of their race and ethnicity. The finding that Native American early adolescents reported higher rates of cyberbullying perpetration compared to White early adolescents is based on a relatively small sample of Native American early adolescents who reported cyberbullying perpetration and may not be representative of this population. Our preliminary finding requires further research, particularly qualitative exploration of cyberbullying experiences among understudied and underserved Native American adolescents, as well as replication, as we are unaware of prior studies reporting this finding.

We found that more screen time was associated with cyberbullying victimization and perpetration, and this was expected given that cyberbullying requires use of an electronic device.[14,15] The internet and social media had the strongest associations with cyberbullying and may be future targets for interventions to prevent cyberbullying.

Overall, fewer early adolescents reported cyberbullying perpetration than victimization. Cyberbullying perpetration could be concentrated among a smaller group of early adolescents, or participants may be less likely to admit to perpetration due to social desirability bias. Similar reporting patterns are seen in intimate partner violence where participants are three times more likely to report being a victim than a perpetrator.[28] Reasons for cyberbullying perpetration include intrinsic and extrinsic factors.[29] Intrinsic factors include a redirection of feelings, instigation, boredom, anonymity/disinhibition, and consolation, while extrinsic factors include a lack of consequences, perceived target differences, and a lack of confrontation.[29]

There are several limitations and strengths of this study worth noting. The data are cross-sectional and differences in sex, race/ethnicity, or socioeconomic status do not reflect causality but could be proxies of other underlying factors. Due to measures being self-reported, there is potential for recall, reporting, and social desirability bias. The effects of some sociodemographic factors were low. The potential for selection bias may be represented by a greater proportion of ethnic/racial minorities and parents with lower education excluded from the analysis. The strengths of this study are derived from the large, diverse, contemporary, and national sample.

Our findings have significant clinical, policy, and public health implications, particularly to inform the adaptation and implementation of digital technology guidance for adolescents.

This research may further inform targeted screen-related guidance for educators, clinicians, and parents. The American Academy of Pediatrics advocates for a Family Media Use Plan,[30] which could incorporate guidance on family discussions on cyberbullying including supports for adolescents at risk for cyberbullying victimization and the consequences of cyberbullying perpetration. Studies show that parental intervention is critical in adolescence; therefore, informing and educating parents on the warning signs of cyberbullying perpetration or victimization could be helpful. Furthermore, school and community-level efforts to engage families may incorporate tailoring culturally sensitive messages to address teaching the youth skills in communication and social empathy, coping with cyberbullying, and digital citizenship.[31] One meta-analysis found that cyberbullying programs were more effective when delivered by technology-savvy content experts compared to teachers.[16] Although the intervention used a trained psychologist as the content expert,[32] future research could examine the role of pediatricians or other healthcare providers. Pediatricians can consider assessing for cyberbullying and provide support and anticipatory guidance for early adolescents, as appropriate, in this highly potentiated period for intervention.[12] However, it is important for pediatricians to note that adolescents may avoid the term “cyberbullying” due to its association with suicidality and severe depression and may instead describe their experiences as “online conflict.”[33]

This study represents an advance in our understanding of cyberbullying prevalence among early adolescents, and how these behaviors are associated with sociodemographic factors. Greater knowledge on the sociodemographic and behavioral risk factors of cyberbullying perpetration and victimization suggest that a wide range of social marginalizing factors correlate with victimization, which requires additional attention. Such efforts can strengthen and inform future individualized early adolescent-focused interventions across numerous technological platforms. Comprehension of the social epidemiology of cyberbullying behavior is crucial, especially given the unprecedented rise of technology usage during the COVID-19 pandemic.[1,34]

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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What's New

In a demographically diverse, contemporary sample of 11–12-year-old early adolescents in the U.S., 9.6% reported a lifetime prevalence of cyberbullying victimization and 1.1% reported lifetime cyberbullying perpetration. Girls, sexual minorities, and adolescents from low-income households reported higher cyberbullying victimization.

Table 1.

Sociodemographic and cyberbullying characteristics of Adolescent Brain Cognitive Development (ABCD) Study participants (N=9,418)

Sociodemographic characteristics	Mean (SD) / %
Age (years)	12.0 (0.7)
Sex (%)	
Female	48.6%
Male	51.4%
Race/ethnicity (%)	
White	56.2%
Latino / Hispanic	19.0%
Black	15.2%
Asian	5.3%
Native American	3.1%
Other	1.2%
Sexual minority status (%)	
Yes / maybe	1.5%
No	73.5%
Don’t understand the question	25.1%
U.S.-born (%)	
Yes	96.3%
No	3.7%
Household income (%)	
Less than $75,000	52.6%
$75,000 and greater	47.4%
Parents’ highest education (%)	
College education or more	16.7%
High school education or less	83.3%
Total screen time	7.0 (5.7)
Television shows/movies	1.6 (1.8)
Videos (YouTube)	1.4 (1.9)
Video games (single player)	1.0 (1.6)
Video games (multi player)	1.1 (1.8)
Texting	0.7 (1.5)
Video chat	0.5 (1.3)
Social media	0.7 (1.6)
Internet	0.4 (0.7)
Cyberbullying Victimization	
Lifetime prevalence	9.6%
Within last 12 months	6.3%
Perpetration	
Lifetime prevalence	1.1%

Sociodemographic characteristics	Mean (SD) / %
Within last 12 months	0.7%

ABCD propensity weights were applied to yield estimates based on the American Community Survey from the US Census. SD = standard deviation

Table 2.

Sociodemographic associations with lifetime cyberbullying victimization and perpetration in the Adolescent Brain Cognitive Development (ABCD) Study

	Cyberbullying victimization		Cyberbullying perpetration	
Sociodemographic characteristics	**OR (95% CI)**	**p**	**OR (95% CI)**	**p**
Sex				
Female	reference		reference	
Male	**0.80 (0.68 – 0.94)**	**0.006**	**1.71 (1.01 – 2.92)**	**0.048**
Race/ethnicity				
White	reference		reference	
Latino / Hispanic	0.84 (0.63 – 1.12)	0.234	1.02 (0.38 – 2.72)	0.966
Black	0.91 (0.71 – 1.17)	0.459	1.60 (0.78 – 3.31)	0.203
Asian	0.65 (0.39 – 1.07)	0.088	1.54 (0.36 – 6.52)	0.560
Native American	1.49 (0.96 – 2.32)	0.078	**4.39 (1.32 – 14.57)**	**0.016**
Other	0.65 (0.25 – 1.71)	0.386	3.21 (0.57 – 17.97)	0.185
Sexual minority				
No	reference		reference	
Yes / maybe	**2.83 (1.69 – 4.75)**	**<0.001**	1.04 (0.14 – 7.72)	0.969
Dont understand the question	**0.79 (0.65 – 0.97)**	**0.027**	0.64 (0.29 – 1.39)	0.256
Country of birth (adolescent)				
United States	reference		reference	
Outside United States	0.81 (0.47 – 1.39)	0.443	0.36 (0.06 – 2.04)	0.250
Household income				
$75,000 and greater	reference		reference	
Less than $75,000	**1.64 (1.34 – 2.00)**	**<0.001**	1.90 (0.95 – 3.82)	0.070
Parents' highest education				
College education or more	reference		reference	
High school education or less	1.11 (0.87 – 1.43)	0.407	1.14 (0.52 – 2.48)	0.744

Bold indicates P < .05. ABCD propensity weights were applied based on the American Community Survey from the US Census.

All models (victimization and perpetration) include sex, race/ethnicity, sexual orientation, country of birth, household income, parent education, and site.

Table 3.

Unadjusted and adjusted associations between screen time and cyberbullying in the Adolescent Brain Cognitive Development Study

Screen time	Cyberbullying victimization, unadjusted		Cyberbullying victimization, adjusted[a]		Cyberbullying perpetration, unadjusted		Cyberbullying perpetration, adjusted[a]	
	Odds Ratio (95% CI)	p	Odds Ratio (95% CI)	p	Odds Ratio (95% CI)	p	Odds Ratio (95% CI)	p
Total screen time	**1.08 (1.07–1.09)**	**<.001**	**1.11 (1.08–1.14)**	**<.001**	**1.09 (1.07–1.10)**	**<.001**	**1.10 (1.06–1.14)**	**<.001**
Television shows/movies	**1.14 (1.10–1.18)**	**<.001**	**1.12 (1.04–1.21)**	**0.004**	**1.12 (1.08–1.17)**	**<.001**	1.08 (0.99–1.19)	0.088
Videos (YouTube)	**1.14 (1.10–1.18)**	**<.001**	**1.17 (1.09–1.25)**	**<.001**	**1.13 (1.09–1.17)**	**<.001**	**1.13 (1.03–1.24)**	**0.009**
Video games (single player)	**1.08 (1.05–1.13)**	**<.001**	**1.14 (1.06–1.22)**	**<.001**	**1.08 (1.04–1.13)**	**<.001**	1.09 (0.99–1.20)	0.074
Video games (multi player)	**1.14 (1.10–1.18)**	**<.001**	**1.18 (1.12–1.25)**	**<.001**	**1.16 (1.11–1.20)**	**<.001**	**1.16 (1.08–1.24)**	**<.001**
Texting	**1.14 (1.10–1.18)**	**<.001**	**1.15 (1.09–1.22)**	**<.001**	**1.12 (1.07–1.16)**	**<.001**	**1.15 (1.06–1.24)**	**0.001**
Video chat	**1.13 (1.09–1.18)**	**<.001**	**1.16 (1.09–1.23)**	**<.001**	**1.12 (1.06–1.17)**	**<.001**	**1.14 (1.04–1.24)**	**0.003**
Social media	**1.18 (1.13–1.22)**	**<.001**	**1.21 (1.15–1.27)**	**<.001**	**1.16 (1.11–1.21)**	**<.001**	**1.19 (1.12–1.27)**	**<.001**
Internet	**1.36 (1.26–1.46)**	**<.001**	**1.28 (1.13–1.45)**	**<.001**	**1.30 (1.20–1.41)**	**<.001**	**1.25 (1.09–1.43)**	**0.001**

Bold indicates p<0.05. ABCD propensity weights were applied to yield estimates based on the American Community Survey from the US Census.

Adjusted models include sex, race/ethnicity, sexual orientation, country of birth, household income, parent education, and site.