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Longitudinal Associations Between Cyberbullying Involvement and Adolescent Mental Health

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A B S T R A C T

Purpose: Cyberbullying differs from face-to-face bullying and may negatively influence adolescent mental health, but there is a lack of definitive research on this topic. This study examines longitudinal associations between cyberbullying involvement and adolescent mental health.
Methods: Participants were 2,480 teenagers taking part in the Olympic Regeneration in East London study. We collected information from participants when they were 12–13 years old and again 1 year later to examine links between involvement in cyberbullying and future symptoms of depression and social anxiety, and mental well-being.
Results: At baseline, 14% reported being cybervictims, 8% reported being cyberbullies, and 20% reported being cyberbully-victims in the previous year. Compared to uninvolved adolescents, cybervictims and cyberbully-victims were significantly more likely to report symptoms of depression (cybervictims: odds ratio [OR] = 1.44, 95% confidence interval [CI] [1.00, 2.06]; cyberbully-victims: OR = 1.54, 95% CI [1.13, 2.09]) and social anxiety (cybervictims: OR = 1.52, 95% CI [1.11, 2.07]; cyberbully-victims: OR = 1.44, 95% CI [1.10, 1.89]) but not below average well-being (cybervictims: relative risk ratio = 1.28, 95% CI [.86, 1.91]; cyberbully-victims: relative risk ratio = 1.38, 95% CI [.95, 1.99]) at 1 year follow-up, after adjustment for confounding factors including baseline mental health.
Conclusions: This study emphasizes the high prevalence of cyberbullying and the potential of cybervictimization as a risk factor for future depressive symptoms, social anxiety symptoms, and below average well-being among adolescents. Future research should identify protective factors and possible interventions to reduce adolescent cyberbullying.

IMPLICATIONS AND CONTRIBUTION

Cybervictims and cyberbully-victims reported poorer mental health 12 months later, even after adjustment for demographic factors and baseline mental health. This longitudinal study examines social anxiety and well-being outcomes. Evidence-based cyberbullying interventions may improve adolescent mental health.

Conflicts of Interest: The funders of the study had no role in the study design, data collection, data analysis, data interpretation, or writing of the report. The corresponding author had full access to the data, wrote the first draft of the paper, and had final responsibility for the decision to submit for publication.
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Online bullying—cyberbullying—has a number of features which distinguish it from face-to-face bullying including the permanence, publicity, and permeability of online messaging. These features may exacerbate effects on adolescent mental health outcomes [1] and may challenge factors central to traditional bullying including repetition, power imbalance, and intentionality [2]. The permanence and ease of sharing online messages mean single acts of online harassment may be repeated when viewed or distributed by others [3–5]. Rather than physical strength, cyberbullies' power may be linked to

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psychological power and technical skills as perpetrators can affect cybervictims' reputations and relationships via the distribution of online messages [6,7]. Intentionality online is complicated by online disinhibition effects as lack of nonverbal cues and social feedback can desensitize individuals and lead to more aggressive behavior online compared to face-to-face settings [7]. Cyberbullying also tends to occur in online environments lacking adult supervision and unrestricted to any specific geographical location, possibly preventing those victimized from escaping its impact [8]. Given issues in defining cyberbullying, inconsistency in estimates of prevalence is unsurprising [3].

The influence of cyberbullying on adolescent mental health has elicited public health concern. Longitudinal research on this topic is rare, though existing studies indicate significant mental health problems associated with cyberbullying involvement. Cybervictimization has shown associations with depressive symptoms 6 months later among Spanish adolescents [4]; U.S. adolescents [9]; and after adjusting for gender, traditional bullying, and age, among Swiss adolescents [10]. Cybervictims may report more social difficulties and higher anxiety and depression than traditional victims [6], and mental health correlates of traditional bullying and cyberbullying may differ. Sjursø et al. [11] found a stronger association between traditional bullying and depressive symptoms and between cyberbullying and anxiety symptoms. Different, and potentially poorer, mental health associated with cyberbullying compared to traditional bullying is likely attributable to the features distinguishing these two forms of bullying.

The ability to draw conclusions from existing studies as to associations between cyberbullying involvement and adolescent mental health is hindered by a lack of high-quality studies [2,3,5]. Most notably, existing research is primarily cross-sectional [4,5]. Additional limitations of previous research include the following: lack of adjustment for confounding factors [4,9,12]; lack of validated mental health measures [5]; and not using longitudinal data to enable adjustment for pre-existing mental illness [13]. Also, studies have not compared longitudinal mental health outcomes for cybervictims, cyberbullies, and cyberbully-victims. Outcomes may differ for these three groups; distinguishing them may improve precision in prevalence estimates and clarify existing inconsistencies in evidence for gender differences in cyberbullying [1]; individuals in these three groups may also respond differently to intervention. Previous research has suggested that the cyberbully-victim group may be larger than the traditional bully–victim group [14] and that mental health outcomes may be poorer for cyberbully-victims than cybervictims [4].

Using a psychiatric epidemiological approach, this study aims to use data from a large, multiethnic adolescent cohort in East London to examine whether involvement in cyberbullying at baseline (as cybervictim, cyberbully, or cyberbully-victim) is associated with poorer mental health (depressive symptoms, social anxiety symptoms, and mental well-being) at 1-year follow-up.

Methods

Study design and participants

The Olympic Regeneration in East London (ORiEL) study was designed to evaluate the impact of urban regeneration associated with the London 2012 Olympic Games on a prospective cohort of adolescents in East London [15]. Twenty-five schools participated (61.0% of those invited). No schools dropped out across the three waves. Information was available for 3,088 year 7 students (aged 11–12 years) across 25 randomly selected schools in four East London boroughs in 2012, a response rate of 86.8%. These adolescents were followed up in January–July 2013 and January–July 2014. Baseline cyberbullying measures were collected from participants at wave 2 (aged 12–13 years) and follow-up measures at wave 3 (aged 13–14 years). Students absent at wave 1 or who joined participating classes were eligible to take part at subsequent waves. All participants in analyses for this paper were present at waves 2 and 3, though some are not members of the original ORiEL cohort [15]. Response rate at baseline was 84% (n = 3,213; wave 2). After exclusion criteria, 77% (n = 2,480) provided follow-up data.

Ethical considerations

Head teachers provided informed consent. Adolescents were enrolled via passive parental consent—parents were given information sheets and opt-out forms in advance. Adolescents provided written assent at each wave following a verbal description of the study. Ethical approval was granted for ORiEL through Queen Mary University of London Ethics Committee (QMREC2011/40), the Association of Directors of Children's Services (RGE110927), and the London Boroughs Research Governance Framework (CERGF113).

Measurement instruments

Outcome measures. Measure of depressive symptoms [16], social anxiety symptoms [17,18], and mental well-being [19,20] related to feelings and experiences during the 2 weeks prior to the survey are described in detail in Table 1.

Cyberbullying involvement. A six-item (six response category) scale used by Ybarra et al. [21] assessed cyberbullying involvement. This scale included three cybervictimization items (In the past 12 months how often have you: received rude or nasty comments from someone online?/Become the target of rumors spread online?/Received threatening or aggressive comments online?) and three cyberbullying items (Now thinking about things you might have done—in the past 12 months, how often have you: Sent rude or nasty comments to someone online?/Spread rumors about someone else online?/Sent threatening or aggressive comments online?). Participants who reported any victimization and no perpetration over the past year were coded as "cybervictims," those who reported no victimization and any perpetration of cyberbullying over the past 12 months were coded as "cyberbullies," and those who reported any victimization and any perpetration of cyberbullying over the past year were coded as "cyberbully-victims." The cybervictimization items showed high reliability in this sample: Cronbach's $\alpha = .89$ (n = 1,749); as did the cyberbullying perpetration items: Cronbach's $\alpha = .91$ (n = 1,737).

Covariates. Gender, ethnicity, and socioeconomic status (SES) were identified a priori as covariates. Participants reported ethnicity using a census-based question adapted to capture characteristics of the highly ethnically diverse East London population (see Table 2).