

# Cyberbullying, Depression, and Problem Alcohol Use in Female College Students: A Multisite Study

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## Abstract

Cyberbullying and its effects have been studied largely in middle and high school students, but less is known about cyberbullying in college students. This cross-sectional study investigated the relationship between involvement in cyberbullying and depression or problem alcohol use among college females. Two hundred and sixty-five female students from four colleges completed online surveys assessing involvement in cyberbullying behaviors. Participants also completed the Patient Health Questionnaire-9 (PHQ-9) to assess depressive symptoms and the Alcohol Use Disorder Identification Test (AUDIT) to assess problem drinking. Logistic regression tested associations between involvement in cyberbullying and either depression or problem drinking. Results indicated that 27% of participants had experienced cyberbullying in college; 17.4% of all participants met the criteria for depression (PHQ-9 score  $\geq 10$ ), and 37.5% met the criteria for problem drinking (AUDIT score  $\geq 8$ ). Participants with any involvement in cyberbullying had increased odds of depression. Those involved in cyberbullying as bullies had increased odds of both depression and problem alcohol use. Bully/victims had increased odds of depression. The four most common cyberbullying behaviors were also associated with increased odds for depression, with the highest odds among those who had experienced unwanted sexual advances online or via text message. Findings indicate that future longitudinal study of cyberbullying and its effects into late adolescence and young adulthood could contribute to the prevention of associated comorbidities in this population.

## Introduction

CYBERBULLYING, ALSO KNOWN AS electronic harassment or online aggression, is an emerging public health concern that has been associated with multiple serious negative consequences. While cyberbullying has no standardized definition, some commonly used definitions include “willful and repeated harm inflicted through the use of computers, cell phones, and other electronic devices”<sup>1</sup> or “an aggressive, intentional act carried out by a group or individual, using electronic forms of contact, repeatedly and over time against a victim who cannot easily defend him or herself.”<sup>2</sup> Most previous cyberbullying work has focused on middle and high school students, with prevalence ranging from around 20% to 40%.<sup>3</sup>

Youths who have been targets of cyberbullying report higher levels of depression and suicidal ideation, as well as

increased emotional distress, externalized hostility, and delinquency compared to nonvictimized peers.<sup>1,4</sup> Furthermore, severity of depression in cybervictimised youths has been shown to be associated with the degree and severity of cyberbullying.<sup>5</sup> Similar negative consequences are seen in victims of traditional bullying,<sup>6</sup> but there is also evidence that involvement in cyberbullying may contribute to depression and suicidality independently of traditional bullying.<sup>7,8</sup>

While much media attention to cyberbullying has focused on its targets, research has shown that perpetration of cyberbullying is also associated with negative health effects. For example, adolescent girls who cyberbully others have been found to have increased rates of depression and anxiety compared with uninvolved peers.<sup>9</sup> In another study, perpetration of cyberbullying was associated with increased substance use.<sup>10</sup> The increased comorbidities among adolescents

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who cyberbully may be due to maladaptive coping to being targets of bullying themselves, or to difficulties in other aspects of their lives.<sup>11</sup>

Prior studies have shown that the roles played by younger adolescents involved in cyberbullying—whether as bullies, victims, or combined bully/victim groups—may have differential risks for psychiatric and physical comorbidity when compared to each other. For example, a study of Finnish adolescents found that cybervictimization was associated with fear for one's safety, poor sleep, somatic symptoms, and emotional and peer problems, while perpetration of cyberbullying was associated with substance use and less prosocial behavior.<sup>12</sup> However, another study of Swedish adolescents found that both cyberbullies and cybervictims have similar increased risk for mental health problems.<sup>13</sup> Furthermore, adolescents who are involved in cyberbullying as both bullies and victims have been found to be most at risk for negative mental and physical health consequences.<sup>9,14</sup>

While previous cyberbullying literature has largely focused on younger adolescents, emerging research has also begun to study this phenomenon in college students. This new focus of research is appropriate, given that college students are among the most frequent users of digital technology.<sup>15</sup> Prevalence rates of cyberbullying among young adults and college students are estimated to be around 10–15%.<sup>16–18</sup> Researchers have proposed that cyberbullying among college students may represent a continuation of behaviors from secondary school, but with new contexts in which students can participate.<sup>19</sup> For example, in one study of college students in the United Kingdom, participants viewed cyberbullying as more acceptable than physical bullying, but less acceptable than verbal bullying.<sup>20</sup> Another qualitative study in the United States reported motivations for cyberbullying among college students as similar to those of younger adolescents (imbalance of power, entertainment value, and retaliation).<sup>21</sup>

Research on negative sequelae of cyberbullying among college students is scarce but growing. In a study of Greek college students, behavioral characteristics of college students involved in cyberbullying had similarities to findings in the younger adolescent cyberbullying literature; cyberbullying perpetration was associated with callous-unemotional traits, and both bullies and victims had increased depressive symptoms and fewer social skills.<sup>22</sup> Previous work in a single site study in the United States suggested increased depression, anxiety, and suicidality in college student *victims* of cyberbullying.<sup>17</sup> However, the relationships between cyberbullying *perpetration* and depression, as well as cyberbullying victimization and other negative health sequelae such as alcohol abuse, are not well understood among U.S. college students.

Depression and alcohol use are among the most common and consequential health concerns for college students. Previous work supports that approximately 30% of college students reported a diagnosis of depression and 9% reported contemplating suicide in the last year.<sup>23</sup> In addition, around 65% of college students use alcohol in any given month, and just under half binge drink (consume five or more alcoholic beverages on one occasion) in any given 2 week period.<sup>24</sup> Previous literature supports positive associations between depression and alcohol use, and heavy alcohol use is also a risk factor for suicide in this population.<sup>25</sup> Given the high prevalence of both depression and alcohol abuse among college

students, examination of risk factors for these health concerns is important for prevention of morbidity and mortality.

The purpose of this study was to determine whether a relationship exists between cyberbullying experiences and depression or alcohol use in college females. A female population was the focus of the study because females are more likely to be involved in and distressed by cyberbullying in younger age groups,<sup>26,27</sup> and college females have a higher burden of depression compared to college males.<sup>23</sup> Based on prior literature review, it was hypothesized that those participants who had experienced cyberbullying would have increased rates of meeting criteria for both depression and problem alcohol use, with the highest rates being in those who participated in cyberbullying as both bullies and victims.

## Methods

### Setting

Data for this cross-sectional study were collected between October and November 2012. Participants were recruited from four universities (three in the Midwest and one in the Western United States, three public and one private school). Due to concerns of potential loss of confidentiality, data for all four schools are reported in aggregate. The study protocol was approved by the Institutional Review Boards at all four universities.

### Participants

Young women aged 18–25 were recruited by distributing flyers to introductory undergraduate communications, biology, nursing, and psychology courses. Flyers contained a link to an online survey. Upon reaching the link to the survey, students were provided with information about the study and asked to provide consent. Students who received flyers received reminder e-mails to complete the survey from course instructors. All participants were provided with a \$5 Starbucks gift card as an incentive.

### Survey

The survey was administered online through the Catalyst WebQ online survey engine, which is a secure online survey system. Students were provided with instructions within the online survey and allowed to skip questions that they did not feel comfortable answering. The survey took participants between 10 and 17 minutes to complete.

### Measures

**Cyberbullying.** In order to characterize cyberbullying among college students, students were asked to respond “Yes,” “No,” or “Don't Know” to the question “Have you ever witnessed, experienced, or participated in cyberbullying in college?” Participants who answered either “Yes” or “Don't Know” proceeded to the next set of questions, asking, “What experiences do you have with cyberbullying? Check all that apply.” Participants were then provided with 11 specific examples of cyberbullying behaviors (Table 1). These behaviors were identified and defined in a previous focus group study of college students' discussions of behaviors perceived as cyberbullying.<sup>28</sup> Examples included hacking into another person's online account, receiving unwanted sexual advances through the Internet, and texting embarrassing or

TABLE 1. DESCRIPTION AND PREVALENCE OF SPECIFIC CYBERBULLYING BEHAVIORS

<i>Variable</i>	<i>Description</i>	<i>Participants reporting<sup>a</sup></i>
Hacking	Hacking into another person's online accounts (Facebook, e-mail, school account)	Total: 36 (50) Bully: 12 (16.7) Victim: 17 (23.6) Bully/victim: 7 (9.7)
Sexual advances	Unwanted sexual advances through the Internet or mobile device (sexting, explicit messages or e-mails)	Total: 36 (50) Bully: 1 (1.4) Victim: 33 (45.8) Bully/victim: 2 (2.8)
Text harassment	Embarrassing or threatening messages sent via text message	Total: 28 (38.9) Bully: 1 (1.4) Victim: 23 (31.9) Bully/Victim: 4 (5.6)
Degrading comments	Posting degrading comments or hate speech	Total: 19 (26.4) Bully: 0 (0) Victim: 16 (22.2) Bully/victim: 3 (4.2)
E-mail	Sending embarrassing or threatening e-mails	Total: 14 (19.5) Bully: 1 (1.4) Victim: 13 (18.1) Bully/victim: 0 (0)
Pictures	Posting explicit or unwanted pictures without consent or knowledge	Total: 13 (18.1) Bully: 0 (0) Victim: 12 (16.7) Bully/victim: 1 (1.4)
False profile	Creating false profiles and using the imposter to post embarrassing comments	Total: 6 (8.4) Bully: 2 (2.8) Victim: 4 (5.6) Bully/victim: 0 (0)
Gaming	Harassing other players during live online gaming	Total: 4 (5.6) Bully: 0 (0) Victim: 2 (2.8) Bully/victim: 2 (2.8)
Outing	"Outing" someone's sexual status or health status (e.g. STI status) online	Total: 3 (4.2) Bully: 0 (0) Victim: 3 (4.1) Bully/victim: 0 (0)
Discrimination	Using the Internet to discriminate against groups of students	Total: 2 (2.8) Bully: 0 (0) Victim: 2 (2.8) Bully/victim: 0 (0)
Groups	Creating groups or Web sites to harass another student or group of students	Total: 1 (1.4) Bully: 0 (0) Victim: 1 (1.4) Bully/victim: 0 (0)

<sup>a</sup>Number of participants reporting and percentage of sample ( $n=72$ ) who had experienced cyberbullying. STI, sexually transmitted infection.

threatening messages. For each of these 11 cyberbullying behaviors, participants reported whether they had been a victim, a perpetrator, or an observer. If a participant indicated that they had bullied using one behavior but were a victim of another behavior, or if they had been both bullies and victims for the same behavior, they were classified as bully/victim.

**Depression.** Participants completed the Patient Health Questionnaire (PHQ-9), a depression screen that has been validated in college students.<sup>29-31</sup> This screen assesses the frequency over the past 2 weeks of each of nine symptoms based on the Diagnostic and Statistical Manual of Mental

Disorders, Fourth Edition (DSM-IV) criteria for major depression, such as depressed mood and anhedonia; responses are on a Likert scale ranging from 0 ("not at all") to 3 ("nearly every day").<sup>32,33</sup> PHQ-9 scores range from 0 to 27, with depression categorization cutoffs of 5 (mild), 10 (moderate), 15 (moderately severe), and 20 (severe). A score of 10 or greater has a sensitivity of 0.88 and specificity of 0.88 for identifying a major depressive episode.<sup>33</sup> For PHQ-9 data, a binary variable for probable depression was created using a score cutoff of 10.

**Alcohol use.** The Alcohol Use Disorder Identification Test (AUDIT)<sup>34</sup> has been validated among college students

to assess problem alcohol use.<sup>35,36</sup> The AUDIT is a 10 question scale with most answers on a 0–4 Likert scale assessing consumption, dependence, and harm/consequences of alcohol use. Questions include an assessment of the frequency of drinking alcohol (never, monthly or less, two to four times a month, two to three times a week, four or more times a week), frequency of binge drinking (never, less than monthly, monthly, weekly, daily), as well as negative consequences associated with alcohol use. AUDIT scores can range from 0 to 40. A previous study in college students found a score of 8 or more on the AUDIT to have a sensitivity of 0.82 and specificity of 0.78 for identifying high-risk alcohol use.<sup>36</sup> For AUDIT data, problem alcohol use was identified based on recommended clinical scoring guidelines for females: a score  $\geq 8$  was considered indicative of problem drinking.

**Demographics.** Demographic characteristics were collected, including race/ethnicity and sexual orientation, which have previously been found to be associated with differences in rates of involvement in cyberbullying, depression, and alcohol use.<sup>37–39</sup>

### Analysis

First, rates of involvement in specific cyberbullying behaviors were reported using descriptive statistics. Then logistic regression was used to test associations between involvement in cyberbullying and either depression or problem drinking. The results of the logistic regression are reported as odds ratios of depression and problematic alcohol use between the three groups. Associations were also tested between involvement in the four most common cyberbullying behaviors and either depression or problem drinking. These specific behaviors were analyzed in aggregate due to the small number of participants endorsing specific cyberbullying behaviors outside of the top four, thus limiting analytical power.

In bivariate analyses, it was found that sexual orientation and race were both associated with differential rates of depression in the sample (OR 0.42 [95% CI 0.20–0.91]; OR 0.25 [95% CI 0.06–0.97], respectively). In addition, race was associated with differential rates of problematic alcohol use (OR 2.2 [95% CI 1.0–4.9]). Thus, in order to account for potential confounders known to be associated with the outcomes of interest, race and sexual orientation were controlled for in the regression analyses. When comparing odds of problematic alcohol groups, age was also adjusted for (i.e., if the participant were older or younger than 21 years of age).<sup>40,41</sup> Of 265 participants, three had missing items on the PHQ-9, five had missing data on the AUDIT, and these participants were therefore dropped from those respective analyses. Analysis was performed using STATA SE12 software (StataCorp, College Station, TX).

## Results

### Demographics

Of the initial recruited sample of 283 students (53.3% response rate), 18 were excluded as they were older than 25 years of age. Thus, 265 female participants were included in all analyses. Participants had a mean age of 20.2 years

(*SD* = 1.7 years), were 84.9% Caucasian, and 96.6% identified as heterosexual (Table 2). There were no statistically significant differences in sample size or demographics across the four schools.

### Cyberbullying

Among participants, 72 (27.2%) reported any involvement in cyberbullying as a bully, victim, or bully/victim. When separating into subgroups, eight participants (3%) were classified as bullies, 45 (17%) as victims, and 19 (7.2%) as bully/victims. Among the participants who had experienced cyberbullying, the most common behaviors reported were hacking into another person's account, receiving unwanted sexual advances, being harassed by text message, and posting of degrading comments (Table 1).

### Depression and alcohol use

Among participants, 46 (17.4%) met the criteria for depression, and 97 (36.6%) met the criteria for problem alcohol use (Table 2).

### Cyberbullying and depression

When investigating associations between cyberbullying and depression, results demonstrated that participants who had experienced cyberbullying had almost three times the odds (aOR 2.9 [95% CI 1.5–5.8]) of meeting clinical criteria for depression (PHQ-9 score  $\geq 10$ ) compared to those with no cyberbullying experience (Table 3). Among participants who had experienced cyberbullying as a bully, the odds for depression were more than four times higher than those with no cyberbullying experience (aOR 4.5 [95% CI 1.1–18.7]). Among those who experienced cyberbullying as a bully/

TABLE 2. DEMOGRAPHICS AND DESCRIPTIVE STATISTICS

	N (%)
Age (years), mean ( <i>SD</i> )	20.2 (1.7)
Race/ethnicity:	
Caucasian/white	225 (84.9)
African American/black	6 (2.3)
Hispanic/Latino	8 (3.0)
Asian/Pacific Islander	12 (4.5)
Other/multiple	14 (5.3)
Sexual orientation:	
Heterosexual	256 (96.6)
Homosexual	4 (1.5)
Bisexual	5 (1.9)
Cyberbullying experience:	
Any	72 (27.2)
Bully	8 (3.0)
Victim	45 (17.0)
Bully/victim	19 (7.2)
Other descriptives:	
Scored $\geq 10$ on PHQ-9	46 (17.4)
Missing PHQ-9 data	3 (1.1)
Scored $\geq 8$ on AUDIT	97 (36.6)
Missing AUDIT data	5 (1.9)

PHQ-9, Patient Health Questionnaire-9; AUDIT, Alcohol Use Disorder Identification Test.

TABLE 3. DIFFERENCES IN ODDS OF DEPRESSION AND PROBLEM ALCOHOL USE BY CYBERBULLYING ROLE BASED ON LOGISTIC REGRESSION ANALYSIS<sup>a</sup>

	Depression <sup>b</sup>		Problem alcohol use <sup>c</sup>	
	aOR [95% CI]	p	aOR [95% CI]	p
<i>Any cyberbullying</i>				
No	1		1	
Yes	<b>2.9 [1.5–5.8]</b>	<b>&lt;0.01</b>	1.6 [0.9–2.9]	0.09
<i>Cyberbullying groups</i>				
None	1		1	
Witness	0.5 [0.1–1.8]	0.30	0.8 [0.4–1.8]	0.68
Bully	<b>4.5 [1.1–18.7]</b>	<b>0.04</b>	<b>4.7 [1.1–20.5]</b>	<b>0.04</b>
Victim	2.1 [0.9–4.9]	0.07	1.1 [0.5–2.3]	0.76
Bully/victim	<b>3.2 [1.0–10.0]</b>	<b>0.05</b>	2.3 [0.8–6.2]	0.11

<sup>a</sup>Odds ratios adjusted for race/ethnicity and sexual orientation. Problem alcohol use odds ratios also adjusted for age (i.e., older than vs. younger than 21 years of age). Statistically significant results are shown in bold.

<sup>b</sup>Score  $\geq 10$  on PHQ-9.

<sup>c</sup>Score  $\geq 8$  on AUDIT.

victim, the odds for depression were also higher (aOR 3.2 [95% CI 1.0–10.0]). Among those who experienced cyberbullying as a victim, there were no significant associations with depression when compared with those who had not experienced cyberbullying.

Experience with any of the top four most prevalent types of cyberbullying behaviors was associated with increased odds for depression (Fig. 1) compared to those with no cyberbullying experience, with unwanted sexual advances having the highest associated odds (aOR 6.1 [95% CI 2.7–13.7]).

#### Cyberbullying and problematic alcohol use

Participants who experienced cyberbullying as a bully had increased odds of meeting the criteria for problem alcohol use (aOR 4.7 [95% CI 1.1–20.5]) compared to those with no cyberbullying experience. Among those who experienced cyberbullying as a victim or bully/victim, there were no significant associations with problem alcohol use compared to those with no cyberbullying experience (Table 3). None of

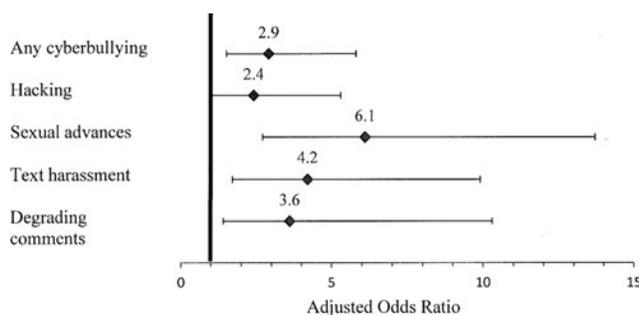


FIG. 1. Odds for depression given individual cyberbullying behaviors as compared to no cyberbullying experience. Depression categorized as score  $\geq 10$  on the Patient Health Questionnaire-9. Odds ratios are adjusted for race/ethnicity and sexual orientation.

the four most prevalent types of cyberbullying behaviors was associated with increased odds for problem alcohol use compared to participants with no cyberbullying experience.

#### Discussion

It was hypothesized that college females who experienced cyberbullying would have increased rates of meeting criteria for both depression and problem alcohol use, with the highest rates in those who participated as both bullies and victims. It was found that participants who reported any experience with cyberbullying, and in particular those who had bullied others or who had been bully/victims, had increased odds of meeting criteria for depression compared to participants with no cyberbullying experience. In addition, the most common cyberbullying behaviors were each independently associated with increased odds of depression; the highest odds were in those who had experienced unwanted sexual advances through the Internet or mobile device. Finally, college females who acted as a bully in their cyberbullying experiences had increased odds of meeting criteria for problem alcohol use on a validated clinical scale compared to those with no cyberbullying experience.

The findings of increased odds for depression in those students who had experienced cyberbullying as both bullies and bully/victims are consistent with previous findings in younger adolescents and confirm the hypothesis.<sup>7,12,42</sup> Findings suggest that college females are as susceptible to the negative mental health effects of cyberbullying as younger adolescents. One possible explanation is that participants who had experienced cyberbullying in college had also experienced cyberbullying or other bullying in earlier years.<sup>16</sup> A longitudinal study has shown that involvement in bullying in childhood can contribute to depression and alcohol use in young adulthood.<sup>43,44</sup> Another explanation could be that existing mental health concerns manifest as aggressive online behavior—previous studies have shown low self-esteem, particularly in middle school and early high school, to be predictive of cyberbullying in later years.<sup>45,46</sup>

To the authors' knowledge, no prior study has addressed specific cyberbullying behaviors' potential relationship to depression or problem alcohol use in older adolescents. In the present study, the finding of a sixfold increase in odds of depression with unwanted electronic sexual advances is particularly striking. Frequent co-occurrence of cyberbullying and online dating abuse has been described in younger adolescents.<sup>47</sup> In the college population, electronic relationship violence has also been described and associated with alcohol use.<sup>48,49</sup> Cyberstalking is a manifestation of such abuse among college students, and in adult samples is associated with decreased well-being.<sup>50,51</sup> The findings here suggest the potential negative impact of electronic sexual harassment on college campuses, thus adding to the growing body of literature on cyberstalking and online dating abuse.

Finally, participants in this study had increased odds of problem drinking behavior if they had experienced cyberbullying as a bully but not as a victim. This is consistent with previous studies that have shown that bullies are at risk for negative outcomes with regard to alcohol use,<sup>52</sup> but is in contrast to previous studies that have shown an association between cybervictimization and alcohol use.<sup>53</sup> One contributor to this discrepancy may be the inclusion of only female

participants. Since males have been found to have increased rates of problem drinking,<sup>41</sup> further research in a male population is warranted. It is noted that the sample overall had a high prevalence of problem drinking. There are many aspects of collegiate culture that contribute to alcohol use in students, which may have made it difficult to detect the impact of cyberbullying on drinking behaviors.

There are several limitations to this study that must be taken into account. First, as a cross-sectional study, causation of depression or problem alcohol use by cyberbullying cannot be inferred. The timing of students' cyberbullying experience was unclear. Whereas it was known that the cyberbullying had taken place during college, the temporal relationship to any depressive symptoms or drinking behaviors is unknown. A longitudinal study is needed to elucidate these associations further. Second, the small numbers of participants classified as bullies and for each specific cyberbullying behavior limited the analytical power for showing associations with the outcomes in question.

Further, there were no survey items about traditional (i.e., in-person) bullying. Traditional bullying and cyberbullying commonly co-occur in younger adolescents.<sup>9,54</sup> Thus, in this sample, increased odds for depression could be due to a larger picture of harassment rather than cyberbullying alone. Further exploration of potential confounders such as sorority membership, family history, and past substance use history would be useful to determine any unique contribution to alcohol use that cyberbullying may have. Other potential confounders such as prior mental health problems, other substance use, or past traumatic experience were also not explored. Finally, the sample was not representative of the general population and was small relative to some cross-university studies. However, given the multisite nature of the study, findings may be applicable to college females.

Despite these limitations, implications of this study include the need for attention to cyberbullying in the college population, not just in middle and high school students. In particular, awareness and prevention of electronic sexual harassment may have a significant impact. Depression and problem alcohol use in female college students are disproportionately high compared to the general population, and are likely multifactorial; knowledge of cyberbullying as a contributing factor could be useful for providers. When caring for female college students with depression or problem alcohol use, asking about cyberbullying experiences may uncover stressors that can be targeted in treatment. Finally, a future longitudinal study of cyberbullying and its effects into late adolescence and young adulthood could contribute to prevention of associated comorbidities in this population.

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### Author Disclosure Statement

No competing financial interests exist.

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