Associations between social media and cyberbullying: a review of the literature

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Abstract: Cyberbullying is a significant public health concern that can lead to increased risk of mental health issues, including psychological and developmental problems or suicide. However, because cyberbullying is a relatively recent phenomenon, there is a lack of agreement among researchers about the definition and prevalence of cyberbullying as well as methods for measuring its prevalence. In this review, we evaluate papers published between January 2013 to August 2015 that explored cyberbullying through the medium of social media. The aims of the study are to (I) clarify the characteristics of people involved in cyberbullying, and (II) identify the types of instruments used to measure cyberbullying on social media. In particular, we attempt to understand the factors underlying abuser behavior, how abusive behavior affects the well-being of victims, and how bystanders mitigate or contribute to the act of cyberbullying.

Keywords: Public health; cyberbullying; social media

Introduction

Social media has had a profound effect on how young people interact with their peers.

The use of social networking sites has increased tremendously over the past decade, with an estimated 80% of U.S. teenagers now using some form of social media (1,2). Social media websites offer an increasingly broad set of functionality and are characterized by user-generated content and a collective communication style (3). Unlike traditional websites, social media allows selective sharing of information and content based on settings the user chooses on his or her account. This ability to share has given young people unprecedented access to private information and a readily available platform to leverage that information against others.

Cyberbullying, a growing problem associated with social media use, has become a significant public health concern that can lead to mental and behavioral health issues and an increased risk of suicide. Cyberbullying has been associated with face-to-face confrontations, concern about going to school, and physical altercations (4). In the United States, a majority of students aged 12 to 18 reported that they were cyberbullied at least twice during the past year (5). Children who are bullied are more likely to experience symptoms of mental health disorders, such as depression and anxiety, changes in sleep and eating habits, increased feelings of loneliness, and loss of interest in activities they used to enjoy (6). Moreover, traditional bullying and cyberbullying victims report self-injurious behavior, suicidal ideation, and exhibit suicidal behaviors at similar levels (7).

Although the field of research on cyberbullying is relatively new, several cyberbullying literature reviews have been published. These reviews have focused on the consequences of cyberbullying (8), defining cyberbullying, and reporting its prevalence (9-11). Additionally, other
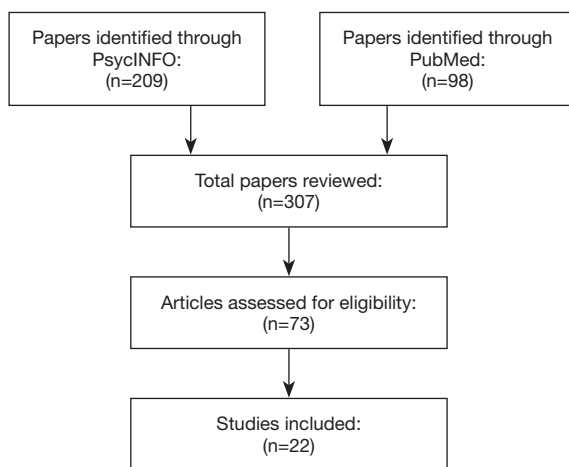
Figure 1 Flowchart of articles evaluated for the literature review.

reviews have focused on more narrow topics such as the relationship between cyberbullying and schools (12), the impact of cyberbullying on adolescents (13), and influencing school policy (14). One study, by Berne and colleagues, concentrates solely on the instruments used by researchers to measure cyberbullying (15).

In this review, we focus on papers that explore the relationship between cyberbullying and social media, with an emphasis on articles that discuss how cyberbullying affects the well-being of young people. The specific aims of the study are (I) to explore the characteristics of people involved in cyberbullying, and (II) to clarify what measurement instruments will lead to consistent, evidence-based evaluations of cyberbullying on social media. In particular, we attempt to understand the factors underlying abuser behavior, the mental health characteristics of victims, and how bystanders mitigate or contribute to the act of cyberbullying.

Methods

A systematic search of PubMed and PsycINFO was conducted to identify relevant papers. For each search, the term "cyberbullying" was used as the main search term and one of the following terms was included: social media, Facebook, MySpace, Twitter. In total, we identified 307 papers, with 98 papers appearing in PubMed and 209 listed in PsycINFO (*Figure 1*).

There is still some debate about how to define cyberbullying. However, researchers have agreed on a working definition that includes four criteria: (I) the sender

must intend to harm the receiver; (II) there is a power imbalance between the sender and receiver (e.g., age, social status, anonymity, physical strength); (III) acts of aggression are usually repeated; and (IV) a personal computer, mobile phone, or other electronic device is used to communicate. For the purposes of this review, this definition was used to parse the search results.

The following inclusion criteria were used to select papers:

(I)   Published in a peer-reviewed journal between January 2013 to August 2015;
(II)   Available in electronic form;
(III) The acting definition of cyberbullying matched the definition presented above;
(IV)   The research design included a social media platform (e.g., Twitter, Facebook);
(V)   An empirical study and original dataset was used (i.e., not a literature review).

Using these guidelines eliminated papers that discussed similar concepts to cyberbullying, such as flaming or harassment. The search results returned numerous papers that discussed traditional bullying but not cyberbullying. Furthermore, many papers evaluated cyberbullying, but did not explore the relationship between cyberbullying and social media; these papers were eliminated from the analysis.

Our initial evaluation of 307 papers resulted in 73 papers being selected for in-depth review. The in-depth review focused on criteria points 3 to 5 above to ensure that each paper detailed an independent empirical study of cyberbullying and its relationship to social media. The in-depth review was completed by a team of two reviewers who worked independently, and a third reviewer made the final selection of papers to retain for the analysis (*Figure 1*).

Data analysis

Data extracted from the papers comprised the following categories: (I) author(s) and year of publication; (II) sample characteristics (sample size, % female, school level, and country); (III) study characteristics (social media platform used for cyberbullying, subpopulation studied, and purpose/objective of paper); (IV) factors significantly related to cyberbullying for the population researched (bullies, victims, bystanders); and (V) cyberbullying definition and frequency (i.e., instrument used to measure cyberbullying and the reported frequency of bullying/cyberbullying).

First, we categorized studies according to the instrument

Table 1 Cyberbullying instrument used (n=22)

Description of instrument	Papers	Papers (%)
Multi-question survey tool that measured multiple dimensions of cyberbullying* during a specified period of time[†]	10	45.4
Direct question to subjects (e.g., "How many times have you been cyberbullied/cyberbullied others?" in a specified period of time)[†]	6	27.3
A negative comment and/or an embarrassing/privacy invading photo were used as actual examples of cyberbullying	2	9.1
Did not measure cyberbullying	4	18.2
Total	22	100

*, of the 10 papers, 9 (40.9%) used survey tools that were established in previous research papers; [†], time periods ranged from the previous week to the previous year.

used to measure cyberbullying. The breakdown of instruments was similar to that reported by Berne and colleagues (15), but was not as extensive. Second, we created a list of the various factors mentioned in each text to explain cyberbullying and to characterize subjects in the study. The papers focused on three subpopulations: victims, bullies, and bystanders. The researchers ran a regression model or conducted a correlation analysis in order to estimate the relationship between cyberbullying and numerous different factors. In these regression models/correlation matrices, a measure of cyberbullying was used as an independent or dependent variable. The factors or variables of interest in the models served as characteristics of the three different subpopulations. If a factor was found to be statistically significant or highly correlated with a measure of cyberbullying, it was added to a list of factors that explain cyberbullying (with respect to each subpopulation).

Results

There was a steady increase in the number of cyberbullying studies published during the 3-year review period: 1 each in 2013 and 2014 (4.5%, respectively), 7 in 2014 (31.8%), and 11 in 2015 (50%). Appendix A summarizes the 22 papers that were reviewed.

There was a general consensus that cyberbullying only affects youths. Of the 22 papers, 14 (63.6%) used a sample consisting of middle school/high school students, 9 (40.9%) included university students, and 3 (13.6%) included primary school students. This youth-oriented focus resulted in 20 (90.9%) of studies being sampled by the school level. The average sample consisted of seven schools, with 7 (31.8%) studies sampling from a single school; 5 (22.7%) studies failed to report the number of schools. Similarly,

6 (27.2%) studies used a non-random convenience sample and 12 (54.5%) studies used some type of randomization. Overall, the average sample size was 129.9 (54.2% female) and the majority of studies did not collect data longitudinally (n=20; 90.9% of the studies consisted of a one-time data collection event).

The most commonly cited social media platforms were Facebook (n=10, 45.4%) and MySpace (n=3, 13.6%). Four other platforms were mentioned, but they were infrequently cited: instant messaging was mentioned twice (9.1%) and Twitter, Instagram, and chat rooms each received one mention (4.6%).

Instruments

The most prevalent instruments used to measure cyberbullying were multi-question surveys (45.4%) followed by direct questions (27.3%) (*Table 1*). The multi-question surveys ranged from 9 to 32 questions in length. Both the multi-survey instruments and the "direct question to subject" instruments asked subjects to recall a period of time ranging from the previous week to the previous year. Of the 10 studies that used multi-question instruments, 9 used instruments featured in previous studies.

To identify the characteristics of individuals involved in cyberbullying, we began by classifying studies according to subpopulation. Studies most frequently researched cyberbullying victims (n=15, 68.2%) or bullies (n=11, 50%), and a smaller number evaluated bystanders (n=7, 31.9%). Ten (45.4%) studies examined both victims and bullies, 5 (22.7%) studies looked at victims alone, and 1 (4.5%) study looked at bullies alone.

As noted above, all multi-question and direct-question instruments asked subjects to recall a specific period of

Table 2 Average reported prevalence of bullying/cyberbullying

Items	In-person bullying	Cyberbullying
Victim	36.67% (n=6)	30.47% (n=12)
Bully	31.28% (n=4)	20.95% (n=7)

This table reports the average levels of bullying/cyberbullying seen in the literature. Four (17%) papers failed to report any values and 5 (21%) papers did not research victim/bully subpopulations.

Table 3 Most commonly cited characteristics of cyberbullying subpopulations

Characteristics	Papers mentioning (%)
Cyberbully victims	
Use SNSs/Internet frequently	3 (20.0)
Depressed/lower happiness levels	3 (20.0)
Has been bullied in person	3 (20.0)
Cyberbullies	
Use SNSs/Internet frequently	2 (18.2)
Have issues at school	2 (18.2)
Know the victim	2 (18.2)
Are themselves victims of cyberbullying	2 (18.2)
Why bystanders help a victim	
See others disagree with bully	2 (28.6)
Effect from seeing viral adverts/videos	2 (28.6)
Why bystanders do not help a victim	
See others joining bully	3 (42.9)

time. For instance, "In the previous year, how many times were you cyberbullied?" Of 13 studies that reported on the prevalence of cyberbullying within their sample, 12 reported timeframes ranging from 1 month to 1 year. These 12 papers used the criteria of being "cyberbullied at least once" during that timeframe as their definition of having experienced cyberbullying (Table 2). When a subject provided a smaller timeframe or was asked about more frequent bullying, the prevalence rate lowered. For example, Navarro and colleagues noted that only 2.9% of their subjects reported being cyberbullied multiple times per week (1.8% reported being bullied multiple times a week) (16).

The findings in each paper were analyzed to create a list of characteristics for the cyberbullying subpopulations. The majority of papers (n=15, 68.2%) modeled cyberbullying/conducted a correlation analysis of cyberbullying or proposed a model that used cyberbullying as an independent variable. Five other papers (22.7%) explored the motivations/perceptions of bystanders with respect to cyberbullying. Only those characteristics found to be statistically significant or highly correlated with cyberbullying were added to the list for each subpopulation. Characteristics of victims (n=21), cyberbullies (n=17), and bystanders (n=10) were compiled. A list of the most commonly cited characteristics was compiled for Table 3.

Discussion

We found that the most commonly used instruments are sophisticated surveys designed to measure multiple dimensions of cyberbullying. In many studies, researchers favored the use of tailored instruments for each subpopulation. The use of complex questionnaires reflects growing sophistication in the field, but it also indicates a lack of agreement on which instrument to use. Of the nine studies that used instruments from previously published work, the most frequently referenced source was from Olweus (17) in three studies. In our analysis, 18 of the 22 (81.8%) studies were published in 2014 or 2015, which reflects the burgeoning state of the field of social media research and cyberbullying.

We agree with the conclusion posited by Berne et al. (15) that the lack of consensus regarding cyberbullying instruments reflects the fact that there is little agreement as to the exact concept being researched (i.e., cyberbullying, electronic bullying, and/or Internet harassment). In counterpoint, this may be the reason why researchers use multiple-dimension surveys: the instruments are used to account for the complexity of cyberbullying/harassment over social media, with specific measures geared toward various aspects of well-being. Another method used to handle complexity was to simplify the concept of cyberbullying for the subjects. Six studies (27.3%) supplied a statement that defined cyberbullying and then asked a direct question based on that definition (e.g., "How many times were you cyberbullied in the last months?"). Two papers (9.1%) went so far as to narrow the working definition of cyberbullying to refer to negative comments and/or embarrassing photos (n=2, 9.1%).

When evaluating the characteristics of the subpopulations,

we found that the literature has advanced beyond limited objectives that estimate the frequency of cyberbullying. While 13 studies (59.1%) did report this value, the majority of papers (68.2%) focused on modeling the relationship between cyberbullying and other independent variables. A common question in many papers was, why do some people become cyberbullies, victims, or bystanders?

Unfortunately, there was little agreement among the studies when it came to interpreting how to distinguish these three categories. The high degree of variability in the findings is reflected in the large number of significant characteristics (17 for bullies and 21 for victims) and the minimal overlap between the findings. The most common characteristics of a bully and victim were found in only 20% and 18% of studies, respectively. In fact, one of the more consistent findings was that the variables were found to be not significant. In at least 3 (27.2%) papers that focused on victims, variables such as age, gender, and ethnicity were found to not be significantly related to cyberbullying, which suggests that the field remains relatively open.

Furthermore, the papers we reviewed did not reveal why bullies and victims assumed their respective roles. We did note that certain characteristics were common among cyberbullies (e.g., being a victim of bullying themselves), and among victims, symptoms of depression were common. More details about these characteristics are listed in *Table 3*.

Finding a solution to cyberbullying was an implicit objective of the studies evaluated for this review, yet there was a lack of consensus among papers concerned with bullies or victims. However, the work on bystanders provided several interesting insights. Of the five papers that focused solely on bystanders, four were experimental studies that introduced interventions designed to influence bystander behavior. Several solutions to engaging bystanders are suggested, with the most common being social support for or against a bully. Two papers found that if others publicly disagreed with a bully, then a bystander was more likely to also disagree and intervene in favor of the victim. However, if others publicly joined the bully, then a bystander was more likely to agree with the bully and intervene in favor of the bully.

Several papers attempted to estimate the relationship between cyberbullying and another concept that could be impacted by cyberbullying. For example, in Cénat *et al*. (18) and Bauman and Baldasare (19), cyberbullying was used as an independent variable in a model that measured psychological distress as the dependent variable. Navarro and colleagues (20) conducted a similar analysis, but instead looked at the relationship between cyberbullying and happiness at school.

One limitation of our study was that we may not have evaluated enough papers to make firm conclusions. Four keyword combination searches were used in order to obtain the final selection of papers, but the literature on social media-based cyberbullying is new and evolving nearly as quickly as the technology itself. This made it difficult to create the most effective keyword searches. An additional limitation is that the study did not use a meta-analysis methodology, which may have proven useful for determining factors associated with the three subpopulations.

Future research should aim to create a standardized set of instruments to evaluate cyberbullying. While some studies appear to have made an important impact and informed the general approach to cyberbullying (e.g., the work of Olweus (17)], the large number of multi-question surveys suggests a need for accurate, reliable instruments. Only with consistent reporting of the incidence and features of cyberbullying will we be able to develop focused prevention strategies.

Future research should aim to advance the cyberbully modeling work outlined in this review, which can be done in three suggested directions. The first suggestion relates to the lack of reliable instruments. This lack of consistency could be indicative of instruments that are not measuring the same concept or are failing to measure significant indications of cyberbullying. Furthermore, there was a significant degree of variability in the nature of the questions posed by the study authors. For example, some researchers focused their questions on negative comments to postings (21), some focused on the media that was used (22), others focused on the number of cyberbullying incidents during a particular time period (23), and still others focused on the emotional impact of the interaction (24,25). This suggests the need for a standardized set of questions that focuses on content and disregards platform.

The second suggestion is to improve study design. Asking a sample of young people their experience with cyberbullying is a sensitive and deeply personal topic for many youth (80.9% of the papers surveyed youth who were high school level or lower). One indication of this problem is that the average non-reply/refuse-to-participate rate was 39% in one study, and as high as 91% in another study. Moreover, most studies required parental consent, which was often obtained via a letter brought home by the student or mailed to parents by school administrators.

These refusal rates suggest that many samples in the literature underrepresent the number of children affected by cyberbullying. One worrisome indication of this lack of representation is that the majority of independent variables were found to be insignificant in several studies (20,23). However, it is possible that the students most likely to be cyberbullied are also the most likely to not participate in a cyberbullying study.

The third suggestion is that researchers should limit their objectives and focus on specific aspects of subpopulations. Many studies started with a broad concept of cyberbullying and then designed a model with a similarly broad array of independent variables. By increasing specificity, future research could supply more practical results.

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Footnote

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