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Bullying and Suicidal Ideation and Behaviors: A Meta-Analysis

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Abstract

BACKGROUND AND OBJECTIVES—Over the last decade there has been increased attention to the association between bullying involvement (as a victim, perpetrator, or bully-victim) and suicidal ideation/behaviors. We conducted a meta-analysis to estimate the association between bullying involvement and suicidal ideation and behaviors.

METHODS—We searched multiple online databases and reviewed reference sections of articles derived from searches to identify cross-sectional studies published through July 2013. Using search terms associated with bullying, suicide, and youth, 47 studies (38.3% from the United States, 61.7% in non-US samples) met inclusion criteria. Seven observers independently coded studies and met in pairs to reach consensus.

RESULTS—Six different meta-analyses were conducted by using 3 predictors (bullying victimization, bullying perpetration, and bully/victim status) and 2 outcomes (suicidal ideation and suicidal behaviors). A total of 280 effect sizes were extracted and multilevel, random effects meta-analyses were performed. Results indicated that each of the predictors were associated with risk for suicidal ideation and behavior (range, 2.12 [95% confidence interval (CI), 1.67–2.69] to 4.02 [95% CI, 2.39–6.76]). Significant heterogeneity remained across each analysis. The bullying perpetration and suicidal behavior effect sizes were moderated by the study's country of origin;

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the bully/victim status and suicidal ideation results were moderated by bullying assessment method.

CONCLUSIONS—Findings demonstrated that involvement in bullying in any capacity is associated with suicidal ideation and behavior. Future research should address mental health implications of bullying involvement to prevent suicidal ideation/behavior.

Recent attention has focused on the association between youth bullying and suicide, reflected in both the public and research arenas.[1] This line of inquiry builds on an extensive literature that documents associations between bullying involvement and psychological distress,[2] and has sought to clarify the extent to which these associations vary by factors such as biological gender, sexual orientation, and type of bullying exposure.[3] Findings with respect to gender differences are mixed: some studies suggest greater suicide risk for girls who are victims of bullying[4] and others indicate greater risk for boys who are victims of bullying.[5] No singular type of bullying has emerged as the strongest predictor of suicidal ideation and behaviors; victims, perpetrators, and those who are both victims and perpetrators (ie, bully-victims) have all been implicated as groups likely to consider or attempt suicide.[6–9]

Two systematic reviews and 1 meta-analysis have been conducted to address the mixed research findings and synthesize the literature on the link between bullying and suicidal ideation and behaviors. In 2008, Kim and Leventhal[10] conducted a systematic review of 37 studies, 27 focused on children and adolescents from the general population and 10 focused on youth with specific characteristics (eg, Asperger syndrome, sexual minority youth). Odds ratios (ORs) from these studies ranged from 1.4 to 10.0; the authors found the strongest risk for suicidality for bully-victims in both the general and specific populations. The results revealed similar ORs for the association between bullying involvement and suicidal ideation and between bullying involvement and suicide attempts. A second systematic review in 2010 of 31 articles[11] that focused only on the link between bullying and suicidality (defined as either suicidal ideation or attempts) in the general population of youth found similar results; ORs ranged from 1.4 to 10.0 in cross-sectional studies and from 1.7 to 11.8 in longitudinal studies. Most recently, the only meta-analysis on this topic to date found that bullying victimization was associated with an increased risk for suicidal ideation (OR, 2.23) and suicide attempts (OR, 2.55).[12]

Although these studies contributed substantial knowledge to the link between bullying and suicidality, the findings have the potential to be extended by quantifying the association not only between bullying victimization and suicidality,[12] but also between perpetration and bully-victimization and suicidality. This meta-analysis differed in several key ways from the only other meta-analysis mentioned above: we include a larger sample of studies, more recent studies, additional predictors (ie, perpetration and bully-victim), and more sophisticated meta-analytic methods. This is the first meta-analysis to date that assesses the association between perpetration and bully-victims and suicidality. Moreover, a more nuanced statistical approach, multilevel meta-analysis, can further assist in accurately characterizing these associations and identifying whether study-level factors (ie, bullying

assessment method, gender, country of origin) moderate the association between bullying and suicidality.

Bullying assessment method, gender, and country of origin were selected as primary moderating factors owing to recent attention to these factors in bullying and suicide research. For instance, researchers have evaluated the extent to which bullying assessment method (eg, with a definition versus using behavioral indicators) moderates the association between bullying and various negative health outcomes. One meta-analysis found that youth who bully exhibited no relation to internalizing behaviors if the bullying measure explicitly referenced bullying, whereas a positive association between bullying and internalizing behaviors was found when the measure included behavioral indicators of aggression.[13] For both bullying and suicide, prevalence estimates indicated that gender differences persist.[14,15] Furthermore, recent findings by Klomek and colleagues[4] suggested that gender moderates the association between bullying and suicidality. Finally, extant research indicated that bullying[13,16,17] and suicide[18] rates vary by country, but less is known about whether the relation between bullying involvement and mental health varies by country. The purpose of this meta-analysis is to address these lingering questions through a systematic and comprehensive review of the extant literature.

METHODS

Selection of Studies

Multiple search methods were used to identify studies published in January 1990 through July 2013 for potential inclusion. First, systematic searches were conducted using databases including PubMed, PsychInfo, Education Resources Information Center, Cumulative Index to Nursing and Allied Health Literature, and ProQuest Dissertations and Theses. Search terms for bullying (bull*, peer victim*, peer abuse, peer victimization, school violence, peer relation, bully, cyber bullying, peer aggression), suicide (suicid*, suicide attempt, self-injury, suicidality, suicidal thoughts, suicidal behavior, psychological autopsy, parasuicide), and youth (adolescents, school, teen, child, peer, teenager, middle school, high school) were included. Second, studies used in the published systematic reviews[10,11] were screened for inclusion. Finally, reference lists from all studies accumulated were screened for possible inclusion.

Inclusion and Exclusion Criteria

To be eligible for inclusion, it was required that studies examined the concurrent association between bullying and either suicidal ideation or behaviors. In addition, the bullying assessment had to clearly measure bullying rather than general peer violence or aggression, which may or may not include bullying instances. This excluded a number of studies, most notably those based on findings from administrations of the Centers for Disease Control and Prevention's (CDC) Youth Risk Behavior Survey before the addition of the bullying-specific items in 2009. Several of these studies described measuring "bullying," however, the behaviors captured using pre-2009 Youth Risk Behavior Survey items did not meet the CDC's uniform definition of bullying, which was used as our guide to determine what constitutes "bullying" as opposed to aggression.[19] With respect to the measurement of

suicidal ideation/behaviors, we included studies that evaluated self-harm in conjunction with other indicators of suicidality, but excluded studies in which authors measured self-harm exclusively.

We also required that included studies assess the association between bullying as an independent variable and suicidal ideation/behaviors as a dependent variable and focus on bullying incidents occurring while in grades K–12. Longitudinal studies were included in this meta-analysis, but only if the association between bullying involvement and suicidal ideation/behaviors was captured at the same time point. This was necessary from an analytic perspective because longitudinal and cross-sectional data cannot be combined in a single meta-analysis. Articles were excluded if they were written in a language other than English; however, we did not exclude studies that administered surveys in languages other than English. Study authors were contacted when sufficient data were not available from the article. See Fig 1 for the Preferred Reporting Items for Systematic Reviews (PRIMSA) figure.[20]

One or 2 member(s) of the research team independently screened each title and abstract. Relevant citations' full text were downloaded and screened for inclusion by 2 reviewers. Disagreements were resolved through a third reviewer unless the decision about inclusion/exclusion for a particular study was not clear. In this case, all 7 members of the research team discussed the article in question to reach consensus.

Data Extraction and Coding

Before coding, the first author developed a coding manual (the full coding manual is available on request from the first author) and coding sheet, which were modified in consultation with other team members. The coding manual included a range of specific aspects of each article to be coded, such as article and sample descriptors, research design descriptors, bullying measurement, components of bullying assessed, suicide measurement, and study findings. Two members of the research team coded each article independently and those 2 individuals discussed any discrepancies to reach a consensus when disagreements persisted. Before reaching consensus, coders agreed on 93% of codes.

Article and Sample Descriptors—The coding sheet included article and sample descriptors including publication type (ie, journal article, unpublished report), publication year, mean age of participants, grade level, race/ethnicity, location of study administration (ie, urban, rural), country of study administration, socioeconomic status of participants, and gender composition of sample.

Research Design Descriptors—Final analytic sample size, where the study was conducted (ie, school, mental health facility), study participation rate, study design (ie, cross-sectional, longitudinal studies that included cross-sectional data), and sampling method (ie, random selection, population sample) were also captured on the coding form.

Bullying Measurement—Because of our interest in understanding if bullying measurement moderated the association between bullying and suicidality, we coded several components of each study's bullying measurement strategy. These included: (1) How

behaviors were described by the authors (eg, was it called bullying, peer aggression?) (2) Were participants provided with a definition of bullying? (3) Was the term "bullying" used anywhere on the survey? (4) How was bullying assessed in this study? (eg, through a definition provided to the students and non-behavioral questions [eg, have you been bullied?], through only a series of behavioral questions (eg, have you been hit or pushed?) (5) Was a previously published bullying scale/instrument used? (6) What was the stated reliability for the bullying instrument? (7) In what ways were youth classified with regard to their bullying involvement? (eg, bully-only, bully/victim) and (8) Who was the reporter for whatever assessment of bullying involvement used? (eg, self-report, peer nomination).

Components of Bullying Assessed—Based on the CDC's uniform definition of bullying,[19] several key components and behaviors should be considered when assessing bullying behaviors. To better understand which components of bullying the studies measured, we coded these items in the studies. Specifically, the coding sheet included items on the types of bullying assessed (eg, physical, relational); definitional components (eg, repetition, power imbalance); and the behavioral constructs mentioned as part of the bullying definition or survey questions (eg, physical assault, social exclusion).

Suicide Measurement—Similar to the bullying measurement items on our coding sheet, items were also included to capture suicide measurement strategies. These items included: (1) How was suicidality assessed in the study? (eg, 2 or more questions measuring factors associated with suicide such as internalization, depression, etc, that are then summed into a suicidality measure, 1 yes/no question directly assessing suicidal thoughts or behaviors) (2) Was a previously published suicidality scale/instrument used? (3) What was the stated reliability for the suicidality instrument? (4) Which components of suicidality are assessed in the study? (eg, thoughts of suicide, suicide attempts) and (5) Who was the reporter for whatever assessment of suicidality was used? (eg, self-report, parent-report).

Study Findings—Finally, we coded effect sizes from each study. Primarily, information was reported to estimate an OR; studies that reported information in a different metric (ie, standardized mean-difference or correlation) were converted to the OR metric using conventional conversions.[21] All effect sizes and variances related to bullying perpetration, victimization, or bully-victim and suicidal ideation and behaviors were coded. Separate effect sizes were noted when study authors disaggregated results by gender.

Statistical Analyses

Six different average effect sizes were calculated for each of the 2 outcomes (suicidal ideation or behavior) and 3 predictors (bullying perpetration, victimization, or bully-victim). Inverse-variance weighted average effects, based on a multilevel random-effects model, were estimated. Multilevel meta-analysis estimation was necessary owing to multiple effect sizes reported within 1 study; for instance, Luukkonen (2009)[22] provided ORs separately for both boys and girls. Rather than average the estimates or take only 1, the multilevel meta-analytic model procedure provides corrected standard errors by estimating 2 random-effect estimates.[23] To determine whether residual heterogeneity remained, we calculated the

homogeneity statistics τ^2 and I^2 for each random effect estimate, both at the effect size (L2) and study levels (L3).[24]

Given significant heterogeneity, we tested 3 moderators for potential association with the effect sizes: gender (all-female sample, all-male sample, or mixture sample), study's country of origin (US or other), and type of bullying assessment. We limited the number of moderator analyses given a concern for multiplicity[25] and the exploratory nature of the analyses. Moderator analyses were conducted by using meta-regression.[26] We also estimated the potential bias owing to publication status by implementing Duval and Tweedie's[27] "Trim and Fill" procedure. The calculation provides an estimate of the number of studies potentially missing owing to non-statistically significant results. Finally, we provided forest plots of all 6 syntheses (Figs 2, 3, 4, 5, 6, and 7). All preliminary analyses were conducted in IBM SPSS Statistics 20 (IBM SPSS Statistics, IBM Corporation), and the R package metafor[21] was used to conduct the multilevel meta-analysis and subsequent moderator and publication bias analyses and to plot the forest plots.

RESULTS

Preliminary Analyses

Based on the inclusion and exclusion criteria, the final meta-analysis sample consisted of 47 studies from 46 peer-reviewed journal articles (the Rigby and Slee [1999][9] article included 2 separate, independent studies). Of these studies, 46 measured bullying victimization, 25 measured bullying perpetration, and 11 measured bully-victim status. Table 1 provides study details for each included article. Studies were published from 1999 to 2013, with the majority published between 2010 and 2013 (n = 27). With respect to study design, a majority (n = 42) were cross-sectional and 5 were longitudinal in nature (although only cross-sectional data from these studies was included in analyses). The majority of surveys (n = 42) were administered in schools; 2 were administered at mental health clinics and 3 included participants from other settings. Of the 40 studies reporting a specific sampling method, 57.5% (n = 23) indicated that a census of participants were administered surveys (ie, all students in a given school), 22.5% (n = 9) of participants were randomly selected, 5% (n = 2) targeted specific participants for survey administration, and 15% (n = 6) used other strategies including non-random selection. With respect to sample characteristics, most samples came from outside the United States (n = 29). The mean sample size was 11 216 (SD, 29 726; range, 168–130 908), and on average 48% of participants were male (range, 0%–80%).

In terms of bullying assessment, 30 studies used the term "bullying" on the survey and 13 studies provided respondents with a definition of bullying. Of the 3 core features of bullying set forth in the CDC uniform definition of bullying, most studies (n = 34) specified that aggressive acts were measured and tapped into the repeated nature of bullying (n = 31); approximately a quarter (n = 12) attempted to assess a power imbalance or differential. A wide range of question types was used to assess bullying. The 2 most common approaches were using a series of behaviorally based questions (n = 18) or asking directly whether the student had bullied others or was bullied with a yes/no response option (n = 14). Other studies provided a definition and used behaviorally based questions (n = 6) or provided a

definition and used non-behaviorally based questions (n = 6). Of the 14 studies reporting bullying scale reliability, half reported moderate (α= 0.60–0.79) and half reported strong (α>0.90) reliability.

With respect to the assessment of suicidality, some studies assessed both suicidal ideation and behaviors, whereas other studies only assessed 1 of these indicators. With respect to the assessment of suicidal ideation or behaviors, the majority of studies (n = 28) used 2 or more questions that directly asked respondents about their suicidal ideation and/or behaviors. Ten studies asked participants a yes/no question directly assessing suicidal thoughts or behaviors, 1 study asked 2 or more questions measuring factors associated with suicide, and the remaining studies (n = 8) used alternate assessment methods for suicidality. Specific components of suicidality assessed included thoughts of suicide (n = 40), plans for suicide (n = 13), and thoughts of death (n = 7). Study authors measured suicidal behavior by asking about recent attempts (n = 25). Of the 11 studies reporting suicidality scale reliability, 10 reported strong (α >0.90) and 1 reported moderate (α = 0.60–0.79) reliability.

Meta-Analysis Findings

Overall—Results demonstrate significant associations between the suicidality outcomes and all 3 bullying categories (ie, victimization, perpetration, and bully-victim) (Table 2). A total of 41 studies (124 effect sizes) were included that measured the relation between bullying victimization and suicidal ideation. Across all studies, we found a statistically significant average OR of moderate size for bullying victimization and suicidal ideation (OR, 2.34; 95% CI, 2.03–2.69). For the association between bullying victimization and suicidal behavior, 18 studies encompassing 33 effect sizes were identified. The results again indicated a significant and moderate average effect size for victimization and suicidal behavior (OR, 2.94; 95% CI, 2.36–3.67).

We identified 23 studies (64 effect sizes) that measured the association between bullying perpetration and suicidal ideation (Table 2). The results of the meta-analysis indicated a significant, moderate average OR for bullying perpetration and suicidal ideation (OR, 2.12; 95% CI, 1.67–2.69). The search and screen procedures yielded 15 studies for a total of 25 effect sizes measuring the relation between bullying perpetration and suicidal behaviors. We again found that the average OR was both statistically significant and of moderate size for bullying perpetration and suicidal behavior (OR, 2.62; 95% CI, 1.51–4.55).

We identified 11 studies (19 effect sizes) that included a measure of an individual's bully-victim status and suicidal ideation (Table 2). The results of the meta-analysis indicated a significant and large average effect size for bully-victim and suicidal ideation (OR, 3.81; 95% CI, 2.13–6.80). A total of 8 studies, including 10 effect sizes, were found for the association between bully-victim status and suicidal behavior. The largest average effect size was found for this analysis for bully-victim and suicidal behavior (OR, 4.02; 95% CI, 2.39–6.76).

Moderator Analysis—If significant amounts of heterogeneity remained for each outcome (ie, suicidal ideation and suicide behaviors), we performed moderator analyses (Tables 3, 4, and 5). For bullying victimization, none of the 3 moderators across either outcome had a

significant relation with the effect sizes. For bullying perpetration and suicidal behaviors, none of the 3 moderators had a significant association with the effect sizes. However, the moderator analyses revealed that the effect sizes for bullying perpetration and suicidal ideation differed as a function of the country of origin (Q-between = 10.92; P <.05); studies originating from the United States (OR, 4.16; 95% CI, 2.21–7.86) had significantly larger effects relative to studies conducted outside the United States (OR, 1.24; 95% CI, 0.54–2.83). We found that the type of assessment significantly moderated the effect sizes between bully-victim and suicidal ideation (Q-between = 17.42; P <.01), where the "definitional and non-behavioral" assessment had a significantly larger effect size (OR, 11.20; 95% CI, 5.05–24.84) relative to the other categories. Some reservations should be noted, however, because only 4 effect sizes across 2 studies were included. Lastly, we found that effect sizes were moderated by the country of origin for bully-victim and suicidal behavior (Q-between = 59.75; P <.01), whereas US-based studies yielded a significantly larger effect size (OR, 10.22; 95% CI, 9.04–11.56) relative to non–US-based studies (OR, 2.36; 95% CI, 1.66–3.35).

Publication Bias—To assess the sensitivity of results to potentially unpublished studies, we used Duval and Tweedie's[27] trim and fill procedure to determine the number of missing studies and an estimate of the OR when imputing and including these studies. Three of the 6 syntheses' trim and fill analysis indicated that 0 studies were potentially missing; 2 of the 6 syntheses' trim and fill analysis indicated that only 1 study was missing and the inclusion of the study yielded a minimal change. One of the 6 syntheses, the OR between victimization and suicidal ideation, yielded potentially biased results because 8 studies could be missing. The imputation and inclusion of these studies, however, continued to yield a statistically significant and meaningful effect size (OR, 2.13; 95% CI, 1.81–2.53). Thus, although it is likely there are unpublished studies not yet included, the impact attributable to publication bias is potentially minimal for this set of studies.

DISCUSSION

The goal of this meta-analysis was to estimate empirically the associations between types of bullying involvement (ie, bullying victimization, bullying perpetration, and bully-victim status) and suicidality, including both suicidal ideation and suicidal behaviors/attempts. A secondary goal was to evaluate factors (ie, gender, country of study, and bullying assessment method) that might moderate this association. Notably, unlike previously conducted meta-analyses on this topic, we used the relatively new and sophisticated multilevel meta-analytic modeling technique to synthesize the effect sizes. Multilevel meta-analysis is a worthy advancement and has the potential to estimate average effect sizes with greater precision, because multiple effect sizes can be included per study. Results demonstrated that moderate to strong associations exist between bullying experiences and suicidality. Furthermore, findings suggested that for some bullying forms, as described below, the country of study and bullying assessment method affect the strength of this association.

The ORs for the association between suicidal ideation and bullying victimization, bullying perpetration, and bully-victim status indicate a significant positive association, with ORs

ranging from approximately 2 to 4. Similarly, the ORs for the association between suicidal behavior and bullying victimization, bullying perpetration, and bully-victim status indicate a significant positive association, with ORs again spanning from approximately 2 to 4. Not surprisingly, bully-victim status had the strongest association. Previous research has demonstrated that youth who are victims and perpetrators of bullying are often more likely to report higher levels of negative health outcomes, such as depression, anxiety, and other internalizing behaviors, as compared with youth who only bully and youth who are only victims.[28]

This meta-analysis also highlights the importance of considering factors that might influence the association between bullying involvement and suicidality. Findings indicated that results varied based on 2 of the 3 moderators we examined. Although gender was not a significant moderator in any analyses, differences were found by country and bullying measurement. The country in which the study was conducted influenced effect sizes for the association between bullying perpetration and bully-victim status and suicidal behavior, with larger effect sizes found for US-based studies. We know from extant literature that prevalence estimates of bullying[29] and suicidality[18] vary by country, as do responses to bullying. Although it is not understood why country moderates these associations, we do know that general perceptions of and responses to bullying are country-specific. Thus, country differences may be in part attributable to differences in countries' approaches to preventing bullying. For example, Scandinavian countries have traditionally seen the lowest prevalence of bullying, and also have the strongest nationwide implementation and sustainability of successful bullying policies and programming.[30] Notably, there were fewer studies conducted in the United States, which could have influenced findings; additional US-based studies would allow for further consideration of the extent to which country influences the association between bullying and suicidality.

Also, the type of bullying assessment method influenced the strength of association between bully-victim status and suicidal ideation, with the largest effect size emerging when "definitional and non-behavioral" assessment methods were used. We also know from research by Vaillancourt and colleagues (2008) that varying measurement strategies impact rates and perceptions of bullying. For example, students' definitions of bullying are not consistent with those prescribed by researchers.[31] Thus, if only a definitional measurement strategy is used, types of behaviors deemed to be bullying by students may not be included. It also might be that this measurement approach captures students who self-identify as being bully-victims, and that having such a self-schema is in turn associated with more deleterious psychological effects.[32]

Nonetheless, the preliminary evidence that bullying assessment method might be a key factor builds on a larger existing conversation regarding bullying measurement. Recently, scholars have begun to articulate the challenges associated with researchers using a range of assessment methods to evaluate bullying involvement,[33] many of which fail to capture key components of bullying, such as power imbalance and repetition.[34] Similarly, there is evidence that bullying prevalence rates vary based on who the reporter is for the bullying assessment (eg, self-report versus teacher-report).[13] As the field moves toward advocating for consistency in measurement, it will be important to evaluate more thoroughly whether

assessment methods capture different sets of youth involved in bullying, given that these subgroups in turn might demonstrate different mental health profiles.

Although we found that bullying involvement was associated with larger effect sizes for measures of suicidality, it is likely only 1 factor among many that plays a role in youth suicidality. Analysis of suicide incident investigative reports from the CDC's National Violent Death Reporting System indicate that relationship problems, recent crises, mental health problems, and dating partner problems are more prevalent precipitating circumstances than bullying issues in these cases.[35] Typically youth experience more than 1 of these types of problems simultaneously.[36]

Studies have also shown that the strength of association between bullying and suicidality decreases when controlling for other individual-level factors. Kim and colleagues (2009)[37] found non-significant associations between bullying and suicidal behaviors and ideations for both males and females when controlling for anxiety, depression, and conduct problems. Similarly, Espelage and Holt (2013)[38] reported that the association between bullying and suicide decreases for bullying victims and bully-victims when controlling for depression and delinquency. Interestingly, few of the longitudinal studies included in this meta-analysis controlled for baseline levels of behavior. However, Undheim and colleagues[39] found that victimization at age 14 years predicted suicidal ideation at age 15 years for both boys and girls, but once analyses controlled for suicidal ideation at age 14 years, this association was no longer significant. Exploring the association between bullying and suicidality without taking into account other factors or baseline levels of behaviors may depict an inaccurate representation of the association. Too few studies, unfortunately, included these factors as covariates, which prohibited our current analysis from including other moderators such as internalizing/externalizing problems and age. The dearth of longitudinal studies in this area precludes sufficient examination of the long-term effects of bullying on suicidal behaviors, making statements such as "bullying causes suicide" impossible to substantiate.

Although this meta-analysis used rigorous methods, there are a few limitations to note. First, although we included dissertations and theses in our search, we did not systematically search for unpublished studies that might have been appropriate for inclusion. As such, given that null results are less likely to be published, our findings might overestimate the association between bullying and suicidality. Our publication bias analysis indicated, however, that the impact of null findings may in fact be negligible for this literature. Second, several studies used suicidality measures that included items on deliberate self-harm. As described earlier, studies only measuring deliberate self-harm were excluded; however, the addition of these studies with a broad definition of suicidality may not be capturing suicidality in its purist form. Third, although additional factors (eg, age, depression) might moderate the association between bullying involvement and suicidality, there were insufficient data to examine additional moderators. Fourth, although our search captured several longitudinal studies, our meta-analysis only included the longitudinal studies that captured cross-sectional data, and thus it was not possible to determine whether there is a causal association between bullying involvement and suicidality. Finally, although this meta-analysis included studies in which surveys were administered in languages other than English, we did not include studies written in languages other than English.

CONCLUSIONS

Taken together, findings from this meta-analysis support and extend the extant literature on the association between bullying involvement and suicidality. Consistent with 2 previous review articles[10,11] and 1 meta-analysis,[12] the current meta-analysis indicates that bullying involvement is associated with an increased risk for suicidality, and being a bully-victim is associated with greatest risk. The results of this meta-analysis also provide the first combined results for the association between bullying perpetration and bully-victim and suicidality outcomes. Our results demonstrate that involvement in bullying in any capacity is associated with suicidal ideation and behavior. Future research would benefit from analysis of the longitudinal effects of youth bullying on suicidal ideation and behaviors to better understand temporality of the association.

Additionally, using data collected from multiple sources, such as those used in the CDC's National Violent Death Reporting System, and conducting qualitative and mixed methods research may shed light on the many precipitators of youth suicide. A focus should also be placed on identifying primary prevention that can affect both victimization and perpetration. With bully-victims being most at risk, targeted interventions may positively impact risk factors and negative outcomes.

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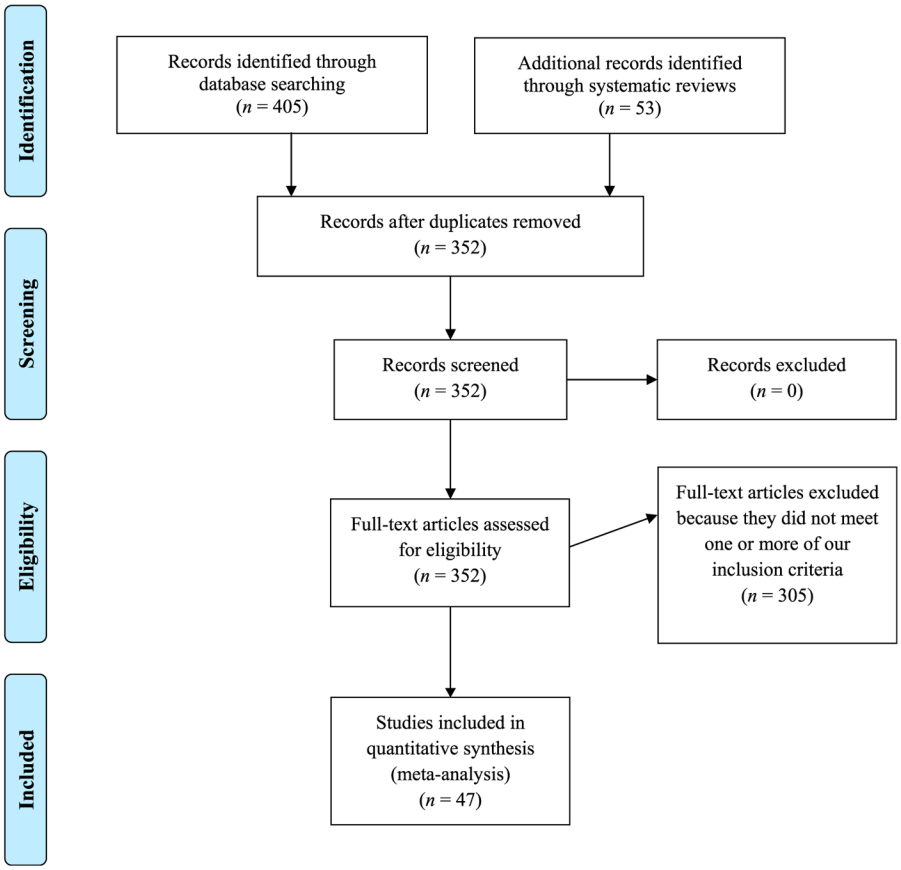

FIGURE 1.
PRISMA flow diagram.

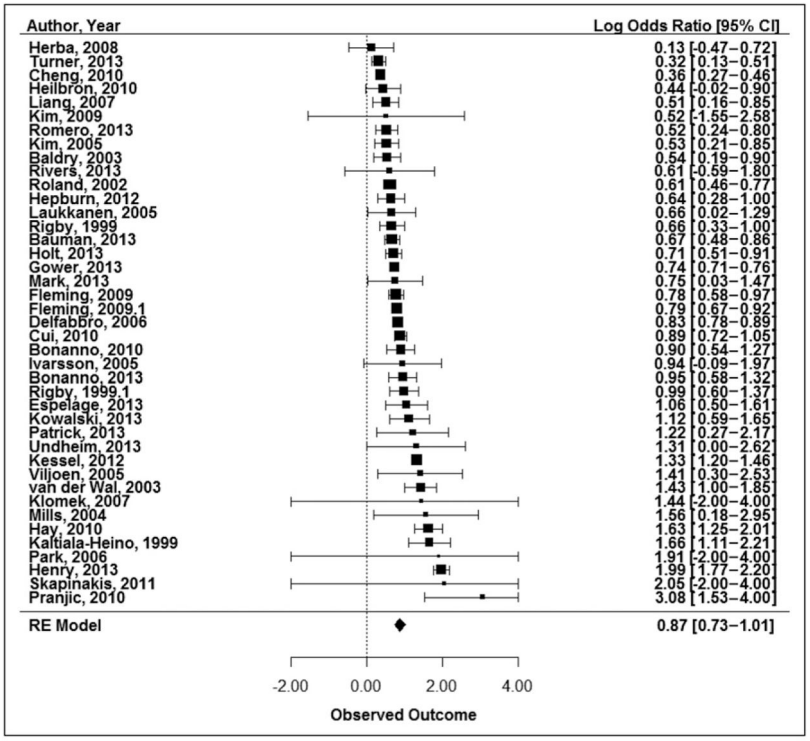

FIGURE 2.

Bullying victimization-suicidal ideation forest plot. Estimates represent log odds ratios; boxes represent weights; bars around the boxes represent the 95% CIs; effect sizes aggregated to the study-level for ease of presentation.

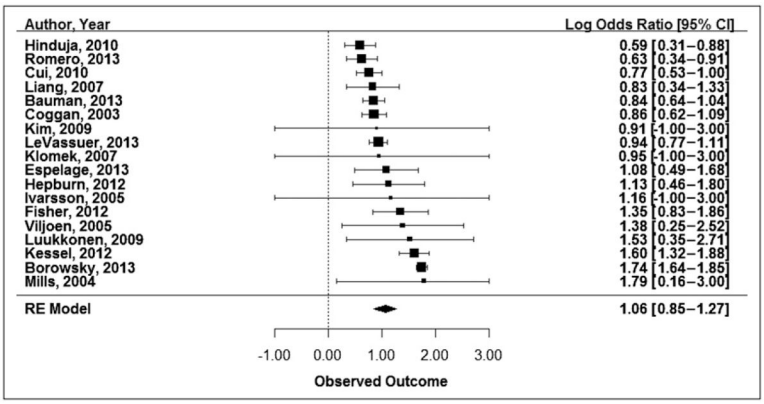

FIGURE 3.

Bullying victimization-suicidal behavior forest plot. Estimates represent log odds ratios; boxes represent weights; bars around the boxes represent the 95% CI; effect sizes aggregated to the study-level for ease of presentation.

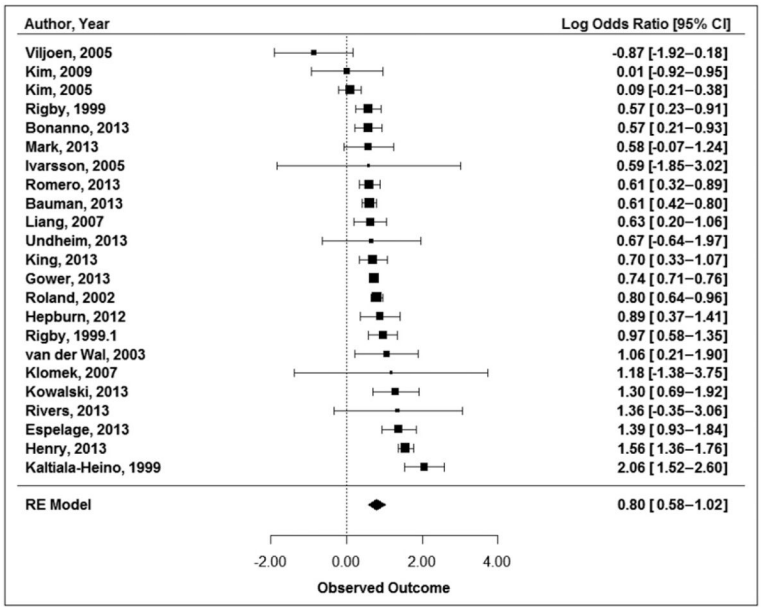

FIGURE 4.

Bullying perpetration-suicidal ideation forest plot. Estimates represent log odds ratios; boxes represent weights; bars around the boxes represent the 95% CIs; effect sizes aggregated to the study-level for ease of presentation.

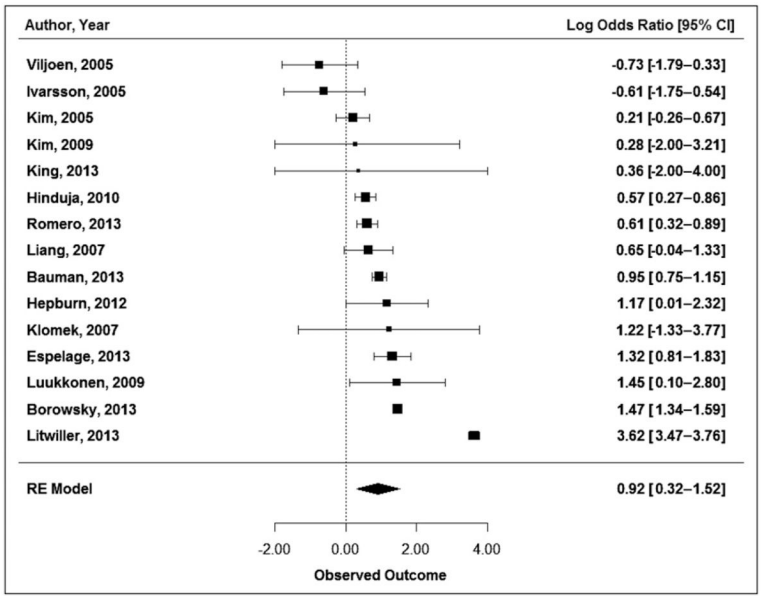

FIGURE 5.

Bullying perpetration-suicidal behavior forest plot. Estimates represent log odds ratios; boxes represent weights; bars around the boxes represent the 95% CIs; effect sizes aggregated to the study-level for ease of presentation.

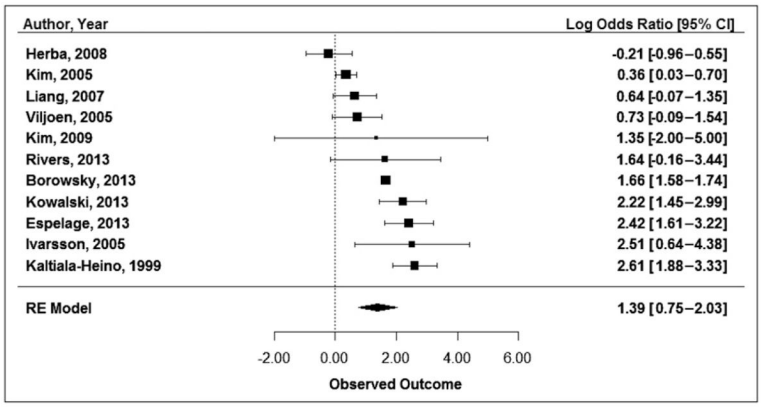

FIGURE 6.

Bully-victim-suicidal ideation forest plot. Estimates represent log odds ratios; boxes represent weights; bars around the boxes represent the 95% CIs; effect sizes aggregated to the study-level for ease of presentation.

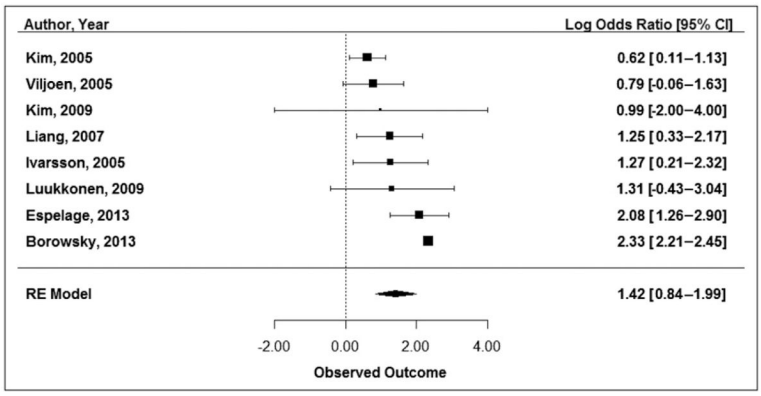

FIGURE 7.

Bully-victim-suicidal behavior forest plot. Estimates represent log odds ratios; boxes represent weights; bars around the boxes represent the 95% CIs; effect sizes aggregated to the study-level for ease of presentation.

TABLE 1

Included Studies

Authors (Year, Country)	Sample (*n*)/ES statistic	Age Range/Mean Age/ Grade Level/% Malea	Location of Study/ Study Design	ES Used in Analysis
Baldry & Winkel (2003, Italy)[40]	998/C	14–19/NA/NA/57	SC/CS	VI
Bauman, Toomey, & Walker (2013, USA)[41]	1491/C	NA/NA/9–12/51	SC/CS	BA/BI/VA/VI/BVA/BVI
Bonanno & Hymel (2010, Canada)[42]	399/C	NA/14.2/8–10/43	SC/CS	VI
Bonanno & Hymel (2013, Canada)[43]	399/C	NA/14.2/8–10/43	SC/CS	BI/VI
Borowsky, Taliaferro, & McMorris (2013, US)[44]	130908/OR	NA/NA/6, 9,12/50	SC/CS	BA/VA/BVA/BVI
Cheng et al (2010, China)[45]	9015/OR	13–15/NA/7, 10/48	SC/CS	VI[a]
Coggan, Bennett, Hooper, & Dickinson (2003, New Zealand)[46]	3265/OR	9–13/NA/NA/44	SC/CS	VA/VI
Cui, Cheng, Xu, Chen, & Wang (2010, China)[47]	8778/OR	11–17/14/NA/49	SC/SD	VA/VI[a]
Delfabbro et al (2006, Australia)[48]	1284/OR	NA/15.2/NA/40	SC/CS	VI
Espelage & Holt (2013, US)[38]	661/OR	10–13/NA/5, 8/49	SC/CS	BA/BI/VA/VI/BVA/BVI
Fisher, Moffitt, Houts, Belsky, Arseneault, & Caspi (2012, UK)[49]	1116/OR	NA/12/NA/49	O/PL	VA
Fleming & Jacobsen (2009a, Chile)[50]	8131/OR	13–15/14/NA/48	SC/CS	VI[b]
Fleming & Jacobsen (2009b, 19 countries)[29]	104614/OR	13–15/14/NA/46	SC/SD	VI[b]
Gower & Borowsky (2013, US)[51]	128681/OR	11–17/NA/6, 9, 12/50	SC/CS	BI/VI
Hay & Meldrum (2010, US)[52]	426/C	10–21/15/NA/50	SC/CS	VI
Heilbron & Prinstein (2010, US)[53]	493/C	11–14/13/6, 8/49	SC/PL	VI
Henry, Lovegrove, Steger, Chen, Cigularov, & Tomazic (2013, US)[54]	2936/C	NA/NA/6, 12/50	SC/CS	BI/V
Hepburn, Azrael, Molnar, & Miller (2012, US)[55]	1838/OR	NA/NA/9, 12/NA	SC/CS	BA/BI/VA/VI
Herba et al (2008, The Netherlands)[6]	1526/OR	NA/12/NA/NA	SC/PL	VI/BVI
Hinduja & Patchin (2010, US)[56]	1963/OR	10–16/13/6, 8/50	SC/CS	BA/VA
Holt, Chee, Ng, & Bossler (2013, Singapore)[57]	3096/OR	NA/NA/NA/56	SC/CS	VI
Ivarsson, Broberg, Arvidsson, & Gillberg (2005, Sweden)[58]	183/OR	13–16/14/NA/49	SC/CS	BA/BI/VA/VI/BVA/BVI
Kaltiala-Heino, Rimpelä, Marttunen, Rimpelä, & Rantanen (1999, Finland)[7]	16410/OR	14–16/15/8, 9/51	SC/CS	BI/VI/BVI
Kessel Schneider, O'Donnell, Stueve, & Coulter (2012, US)[59]	20406/OR	NA/NA/9, 12/50	SC/CS	VA/VI
Kim, Leventhal, & Koh (2009, Korea)[37]	1655/OR	NA/14/7, 8/55	SC/PL	BA/BI/VA/VI/BVA/BVI
Klomek, Marrocco, Kleinman, Schonfeld, & Gould (2007, US)[8]	2342/OR	13–19/15/9, 12/58	SC/CS	BA/BI/VA/VI
Kowalski & Limber (2013, US)[60]	931/SMD	11–19/15/6, 12/58	SC/CS	BI/VI/BVI
Laukkanen, Honkalampi, Hintikka, Hintikka, & Lehtonen (2005, Finland)[5]	168/OR	11–23/18/NA/58	MH/CS	VI

Authors (Year, Country)	Sample (*n*)/ES statistic	Age Range/Mean Age/ Grade Level/% Malea	Location of Study/ Study Design	ES Used in Analysis
LeVasseur, Kelvin, & Grosskopf (2013, US)[61]	11488/OR	NA/NA/9, 12/48	SC/CS	VA
Liang, Flisher, & Lombard (2007, South Africa)[62]	5074/OR	NA/16/8, 11/42	SC/CS	BA/BI/VA/VI/BVA/BVI
Litwiller & Brausch (2013, US)[63]	4693/C	14–19/16.11/NA/47	SC/CS	BA
Luukkonen, Räsänen, Hakko, & Riala (2009, Finland)[22]	508/OR	12–17/NA/NA/41	MH/CS	BA/VA/BVA
Mark et al (2013, Estonia, Lithuania, & Luxembourg)[64]	4954/OR	14–17/16/NA/51	SC/CS	BI/VI
Mills, Guerin, Lynch, Daly, & Fitzpatrick (2004, Ireland)[65]	209/OR	12–15/14/NA/46	O/CS	VA/VI
Park, Schepp, Jang, & Koo (2006, South Korea)[66]	1312/OR	NA/NA/10, 12/50	SC/CS	VI
Patrick, Bell, Huang, Lazarakis, & Edwards (2013, US)[67]	26523/OR	NA/NA/8, 10, 12/48	SC/CS	VI
Pranjić & Bajraktarević (2010, Federation of Bosnia and Herzegovina)[68]	290/OR	NA/17/NA/51	SC/CS	VI
Rigby & Slee (1999, Australia)[9]	1103/C	12–18/15/NA/49	SC/CS	BI/VI
Rigby & Slee (1999, Australia)[9]	845/C	12–16/14/NA/53	SC/CS	BI/VI
Rivers & Noret (2013, UK)[69]	1592/SMD	12–16/14/NA/54	SC/CS	BI/VI/BVI
Roland (2002, Norway)[70]	2088/C	NA/14/8/49	SC/CS	BI/VI
Romero, Wiggs, Valencia, & Bauman (2013, US)[71]	650/C	14–18/16/9, 12/0	SC/CS	BA/BI/VA/VI
Skapinakis et al (2011, Greece)[72]	2431/OR	16–18/NA/10, 12/41	SC/CS	VI
Turner, Exum, Brame, & Holt (2013, US)[73]	1874/SMD	11–18/14/6, 12/49	SC/CS	VI
Undheim (2013, Norway)[39]	2464/SMD	12–15/14/49	SC/PL	BI/VI
van der Wall, De Wit, & Hirasing (2003, The Netherlands)[74]	4721/OR	9–13/NA/NA/50	SC/CS	BI/VI
Viljoen et al (2005, Canada)[75]	243/OR	13–19/16/NA/80	O/CS	BA/BI/VA/VI/BVA/BVI

BA, bullying-attempts; BI, bullying-ideation; BVA, bully-victim-attempt; BVI, bully-victim-ideation; C, correlation; CS, cross-sectional; ES, effect size; H, hospital; MH, mental health facility; NA, not applicable or not provided; O, other; PL, prospective longitudinal; SC, school; SD, secondary data; SMD, standardized mean difference or *d*; VA, victim-attempts; VI, victim-ideation. Cheng and colleagues (2010) and Cui and colleagues (2010) use the same Global Student Health Survey (GSHS) dataset from China; however, they use different strategies for selecting bullying victims. For example, victims in the Cheng et al (2010) study were categorized as “ever victimization” versus “never victimization,” but the Cui et al (2010) study categorizes victims as reporting “never or rarely victimized” versus “sometimes bullied.”

Both Fleming and Jacobsen (2009) studies use data from the GSHS. Effect sizes for Chile were removed from the effect sizes representing the Fleming and Jacobsen (2009b) study because Fleming and Jacobsen (2009a) use Chile data. Similarly, because Cui et al (2010) and Cheng et al (2010) used GSHS from China, effect sizes from China representing the Fleming and Jacobsen (2009b) study were not used in analyses.

TABLE 2

Effect Sizes by Bullying Type: Victimization, Perpetration, and Bully-Victim

Type	Outcome	k (n)	OR (95% CI)	L2: τ^2, I^2	L3: τ^2, I^2
Bullying victim					
	Suicidal ideation	41 (124)	2.34 (2.03–2.69)	0.06, 21.60	0.19, 78.70
	Suicidal behavior	18 (33)	2.94 (2.36–3.67)	0.19, 71.01	0.06, 23.52
Bullying perpetration					
	Suicidal ideation	23 (64)	2.12 (1.67–2.69)	0.01, 0.01	0.27, 98.51
	Suicidal behavior	15 (25)	2.62 (1.51–4.55)	0.06, 6.10	0.94, 91.30
Bully-victim					
	Suicidal ideation	11 (19)	3.81 (2.13–6.80)	0.01, 0.01	0.78, 91.63
	Suicidal behavior	8 (10)	4.02 (2.39–6.76)	0.35, 72.50	0.01, 0.01

k, number of studies; L2, effect size level; L3, study level; n, number of effect sizes; victim, victimization.

TABLE 3

Bullying Victimization Moderators

	Suicide Ideation			Suicide Behaviors		
	k (n)	**OR (95% CI)**	**Q-Between**	**k (n)**	**OR (95% CI)**	**Q-Between**
Gender			4.31			1.51
Mixture	29 (72)	2.27 (1.92–2.68)		14 (29)	2.90 (2.27–3.70)	
All-female	14 (28)	2.73 (2.11–3.53)		2 (2)	2.33 (0.76–7.15)	
All-male	14 (28)	2.29 (1.77–2.96)		2 (2)	7.85 (1.38–44.63)	
Country			1.00			0.25
US	15 (50)	2.55 (2.04–3.18)		10 (20)	2.94 (2.18–3.96)	
International	28 (78)	2.22 (1.84–2.64)		10 (13)	2.88 (1.94–4.27)	
Bully assessment			9.89			0.76
Definition and non-behavioral	5 (13)	3.14 (2.06–4.78)		2 (6)	2.36 (1.18–4.74)	
Series of behavioral questions	12 (26)	2.89 (2.25–3.70)		5 (7)	2.90 (1.83–4.58)	
Definition and series of behavior questions	6 (22)	1.93 (1.41–2.66)		—	—	
Only asking if they were victimized/bullied	11(35)	2.30 (1.76–2.99)		7 (14)	2.93 (1.99–4.30)	
Peer nominations	5 (13)	1.60 (1.09–2.36)		2 (2)	2.50 (0.10–63.55)	
Multiple categories	3 (18)	2.10 (1.39–3.19)		—	—	

k, number of studies; *n* = number of effect sizes. —, No studies used a definition and series of behavior questions or multiple categories to assess the relationship between bullying victimization and suicidal behaviors.

TABLE 4

Bullying Perpetration Moderators

	Suicide Ideation			Suicide Behaviors		
	k (n)	OR (95% CI)	Q-Between	k (n)	OR (95% CI)	Q-Between
Gender			2.47			0.78
Mixture	14 (33)	1.88 (1.37–2.58)		13 (22)	2.63 (1.41–4.92)	
All-female	9 (16)	2.55 (1.75–3.72)		2 (2)	1.90 (0.31–11.47)	
All-male	9 (16)	2.45 (1.68–3.57)		2 (2)	4.30 (0.48–38.51)	
Country			2.65			10.92*
US	9 (26)	2.65 (1.85–3.78)		9 (17)	4.16 (2.21–7.86)	
International	14 (38)	1.79 (1.31–2.44)		6 (8)	1.24 (0.54–2.83)	
Bully assessment			8.33			2.82
Definition and non-behavioral	4 (12)	3.38 (1.99–5.75)		2 (6)	2.69 (0.58–12.5)	
Series of behavioral questions	9 (21)	2.26 (1.58–3.24)		7 (10)	4.08 (1.70–9.8)	
Definition and series of behavior questions	3 (14)	2.01 (1.07–3.80)		—	—	
Only asking if they were victimized/bullied	4 (9)	1.68 (0.95–2.96)		3 (4)	1.31 (0.36–4.75)	
Peer nominations	2 (6)	0.99 (0.49–2.02)		2 (3)	1.29 (0.24–7.03)	
Multiple categories	—	—		—	—	

k, number of studies; n, number of effect sizes.

*P <.05.

—, No studies used a definition and series of behavior questions or multiple categories to assess the relationship between bullying perpetration and suicidal behaviors.

TABLE 5

Bully-Victim Moderators

	Suicide Ideation			Suicide Behaviors		
	k (n)	**OR (95% CI)**	**Q-Between**	**k (n)**	**OR (95% CI)**	**Q-Between**
Gender			0.93			1.02
Mixture	9 (13)	3.43 (1.76–6.67)		6 (6)	4.16 (2.25–7.69)	
All-female	2 (3)	7.93 (1.57–39.99)		2 (2)	2.02 (0.33–12.21)	
All-male	2 (3)	5.85 (1.36–25.2)		2 (2)	6.14 (0.61–61.44)	
Country			3.33			59.75**
US	3 (4)	7.99 (3.04–21.03)		2 (2)	10.22 (9.04–11.56)	
International	8 (15)	2.70 (1.41, 5.18)		6 (8)	2.36 (1.66–3.35)	
Bully assessment			17.42**			2.98
Definition and non-behavioral	2 (4)	11.20 (5.05–24.84)		—	—	
Series of behavioral questions	4 (5)	4.72 (2.53–8.81)		3 (3)	6.20 (2.93–13.15)	
Definition and series of behavior questions	—	—		—	—	
Only asking if they were victimized/bullied	2 (2)	3.04 (1.05–8.81)		2 (2)	3.51 (1.21–10.17)	
Peer nominations	3 (8)	1.26 (0.63–2.52)		2 (3)	1.90 (0.57–6.38)	
Multiple categories	—	—		—	—	

k, number of studies; n, number of effect sizes.

** P <.01.

—, No studies used a definition and a series of behavioral questions or multiple categories to assess the relationship between bully-victim and suicidal ideation. No studies used a definition and non-behavioral questions, a definition and a series of behavioral questions, or multiple categories to assess the relationship between bully-victim and suicidal behaviors.