Title: **Bullying and cyberbullying studies in the school-aged population on the island of Ireland: A Meta-Analysis (BJEP.16.0115)**

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Abstract

Background: Bullying research has gained a substantial amount of interest in recent years because of the implications for child and adolescent development. *Aim and sample:* We conducted a meta-analysis of traditional and cyber bullying studies in the Republic and North of Ireland to gain an understanding of prevalence rates and associated issues (particularly psychological correlates and intervention strategies) amongst young people (primary and secondary school students). *Method:* Four electronic databases were searched (PsychArticles, ERIC, PsychInfo and Education Research Complete) for studies of traditional bullying and cyberbullying behaviours (perpetrators, victims or both) published between January 1997 and April 2016. *Results:* A final sample of 39 articles fit our selection criteria. CMA software was used to estimate a pooled prevalence rate for traditional/cyberbullying victimisation and perpetration. A systematic review on the psychological impacts for all types of bullying and previously used interventions in an Irish setting are also provided. *Conclusions:* The results demonstrate the influence moderating factors (e.g., assessment tools, answer scale, time frame) have on reported prevalence rates. These results are discussed in light of current studies and points for future research are considered.

Key words: Bullying, cyberbullying, victimisation, Republic of Ireland, Northern Ireland

Bullying research has gained a substantial amount of interest in recent years because of the implications for child and adolescent development. The earliest definition of bullying was provided by Olweus (1991) who described it as occurring when an individual is repeatedly exposed to intentional negative actions by another person(s), creating an imbalance in power between the perpetrator and victim. In general, the literature points to four facets of traditional (face-to-face) bullying behaviour: intentionality, repetitiveness, involving a power imbalance and causing negative effects (Smith, 2014). It can be subdivided into specific behaviours including physical (e.g., kicking), verbal (e.g., saying hurtful things), relational (e.g., gossiping), and cyberbullying (e.g., posting negative comments about a person online).

Indeed, there has been an explosion of research in recent years into cyberbullying in particular. It is defined by Smith et al., (2008) as 'an aggressive, intentional act carried out by a group or individual, using mobile phones or the internet, repeatedly and over time against a victim who cannot easily defend him or herself' (p. 376). Although the definition of cyberbullying incorporates similar elements to traditional bullying (i.e., intentionality, power imbalance and negative effects), there are several factors that distinguish the two. The most obvious of these is the anonymity that can be attached to a cyberbullying incident and one could argue that this might increase the power hierarchy between the perpetrator and the victim (Sticca & Perren, 2013). Another significant difference is the large audience that a cyberbullying incident can reach, which could increase the impact the incident has on the victim's life (Grigg, 2010).

Regardless of the methods used, research has demonstrated a significant link between bullying experiences in childhood and adolescence and the subsequent social and emotional development of those involved. For example, exposure to peer victimisation has been linked to anxiety, depression, low self-esteem, psychosis and even suicide across all age groups (Wolke, Copeland, Angold, & Costello, 2013). In addition, other factors such as lower academic achievement and early school leaving are demonstrated outcomes of bullying experiences (Cornell, Gregory, Huang, & Xitao, 2013; Hammig & Jozkowski, 2013).

Despite the wealth of international research, bullying and its effects are relatively under-researched in schools across Northern Ireland and the Republic of Ireland. To date such investigations are often isolated and limited in their attempts to summarise the broad areas of available research. There are some existing reviews on prevalence rates of bullying on the island of Ireland (e.g., O'Moore, 2013; McGuckin, 2013) which provide a platform for the current research. However, there has been renewed interest in recent years, perhaps as a result of high profile cases of cyberbullying incidences covered in the media. As such, we determined that a systematic review of the literature and meta-analysis of the bullying and victimisation prevalence rates are an important and necessary process in determining the current situation of traditional (face-to-face) and cyber-bullying for children and adolescents on the island of Ireland. The by-product of such a review will hopefully contribute to a future research agenda that targets particular areas that have been under-researched.

There are three central aims to the current systematic review and meta-analysis. First, we will synthesis the results on the prevalence rates of bullying and victimisation and give details of the different types of bullying where possible according to different school levels and different moderators. Second, we will present

the available evidence on the psychological impact of bullying (traditional and cyber) on our young people to date. Third, we will outline the intervention procedures that have been implemented in the context of Northern Ireland and the Republic. We will conclude by giving suggestions for future research agendas based on the gaps identified from the current literature search.

Method

Search Strategy

The structure of this systematic review is based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher, Liberati, Tetzlaff, Altman, & The PRISMA Group, 2009; see Supplementary Table 1). We conducted one literature search for cross-sectional and longitudinal studies of traditional bullying and cyberbullying behaviours (perpetrators, victims or both) published between January 1997 and April 2016. The following search terms were used: bully* OR bulli* OR victim*, viole* OR aggress* OR harass* OR fight* OR antisocial* OR delinquen* OR cyber OR online* OR electronic OR virtual OR internet OR net OR web OR chat OR social net* AND ir*. These search terms were decided on after an initial search of the literature and reading in the area. We searched four electronic databases: PsychArticles, ERIC, PsychInfo and Education Research Complete. These databases were chosen because they were representative of the international literature on the specific but related disciplines of psychology and education. We also searched the Department of Education's websites in both the North and Republic of Ireland and hand-searched the publications of known experts in the field. These areas were believed to be the most relevant to the area of bullying and the most common domains in which literature relevant to bullying is published.

Inclusion and exclusion criteria

The overall systematic literature search yielded 1734 articles, 229 of which were duplicates. In order to be included in the analysis, the study had to meet several criteria. First, the study had to include a measure of either bullying or cyberbullying that was directly relevant to child and/or adolescent populations (4-18 years). Studies that assessed this age range in schools or other settings were included, however, the study had to include students themselves and not a third party (e.g., teacher) reporting on their behalf. Second, the studies that will be included in the meta-analysis (first aim) were required to be quantitative and should report (or provide if contacted by the researchers) sufficient information (e.g., percentages and sample sizes). Finally, the studies needed to be published sources (dissertations and unpublished materials were not included). Studies were excluded for the following reasons: (1) it was a qualitative analysis; (2) it assessed other populations that were not solely based in Northern or the Republic of Ireland; (3) authors did not provide sufficient information when contacted for the meta-analysis; and (4) papers did not investigate a school-aged (4-18 years) population.

We reviewed the titles and abstracts of all articles found and excluded 1466 on the criteria outlined above. The final sample consisted of 39 papers and is shown in Table 1.

TABLE 1

Data analysis

To investigate our first aim (victimisation and perpetration prevalence), we calculated a pooled percentage for each bullying type and for each school type (primary versus post-primary) separately. The prevalence of bullying and

victimisation for each type of bullying across each school type was computed from the total sample and the specific sample size of bullies and victims.

Meta-analysis was conducted with the Comprehensive Meta-Analysis (CMA) software (Borenstein, Hedges, Higgins, & Rothstein, 2005). Effect sizes are reported as pooled percentages with 95% confidence intervals for each study. The difference (Cohen's *d*) compares the individual study's percentage to the overall percentage mean across studies at each bullying type and school type. A *d* of .20 is a small, .50 medium and .80 or more a large effect (Cohen, 1988). Effect sizes were analyzed using the random effects model, in which the error term is composed of variation originating from both within-study variability and between-study differences (Borenstein, Hedges, Higgins & Rothstein, 2009; Cooper & Hedges, 1994).

The distribution of effect sizes was examined using tests of heterogeneity. Significant heterogeneity indicates that differences across effect sizes are likely due to sources other than sampling error, such as tools used, different answer codes, time frame, whether bullying definition was supplied or not, and gender. Categorical moderator tests were applied to test for between groups Q (Q_b). A significant value for Q_b indicates that the effect sizes are significantly different across different categories of the moderator variable.

We examined the potential for publication bias by using two methods. First, the Begg and Mazumdar (1994) rank correlation test (Kendall's tau b) which looks at bias according to study size. Hence, if small studies with controversial results were less likely to be published, the correlation between variance and effect size would be high. Conversely, lack of significant correlation can be seen as absence of publication bias. Secondly, we computed Rosenthal's failsafe number (FSN; i.e. the number of studies that would be required to nullify the observed effect) for the combined effect

size, separately for studies that looked at victimisation and those which looked at bullying others to address the "file drawer problem" (Rosenthal, 1991). A tolerance level around a failsafe N equal to 5 times the number of effect size (k) plus 10 ("5k + 10" benchmark; Rosenthal, 1979) was calculated. Satisfactoriness is established if the fail-safe ratio exceeds Rosenthal's threshold at 1.00. As such, when the fail-safe number consistently exceeds the 5k + 10 benchmark then there is no need for additional research to establish the phenomenon.

For our second and third aim, a systematic review of the available literature is presented. The range in outcomes for psychological correlates (e.g., self-esteem, depression) were too broad to synthesis using CMA. Instead, they are described in detail below. There were few studies investigating interventions and they are also presented below.

Results

In general, the studies were divided into investigations of prevalence rates, psychological impacts and interventions. Bullying prevalence was the most widely studied issue in the current set of studies (26 studies). Psychological impact was next with 10 papers directly relevant and then interventions (7 studies). Many papers reported findings of more than one of these categories (e.g., prevalence and impact) and some reported on other issues such as definitions, gender and personality characteristics (8). The most common type of study was a cross-sectional analysis using a survey type research tool (e.g., the Olweus Bullying Questionnaire, OBQ) and the most common location was in a school setting. While we choose to focus on peer bullying in the child and adolescent years, it is worth noting that no investigations of sibling bullying were found in the search.

Prevalence of Bullying and Victimisation

Most analyses involved investigations of school bullying and as such data collection predominately took place in schools across the island of Ireland. Several papers referred to bullying in general terms, not accounting for different types (e.g., physical or verbal) and most presented the students with definitions of what it encapsulated. The majority of studies focused on the adolescent years and gathered data in schools, with the exception of Dyer and Teggart (2007) who collected data in the Child and Adolescent Mental Health (CAMHS) service users in Northern Ireland. Details of these studies are provided in Supplementary Table 2.

Prevalence rates varied greatly depending on the categorization implemented by the researchers. In order to get a pooled estimate of prevalence of traditional and cyber perpetration and victimisation we combined the studies in Northern Ireland and the Republic of Ireland (across primary and post-primary schools) and analysed them using CMA. The studies differed greatly in terms of: (a) the methods used to collect data (e.g., OBQ versus single questions); (b) the time frame participants were questioned about (ranging from 'ever' to two months previous); (c) the particular definition given, if at all; (d); the way in which involvement was categorised (answer scale: ranged from a simple 'yes' answer to 'every day'); (e) gender and (f) whether the study supplied a definition of bullying or not. We therefore also included these as moderators to check their influence on prevalence.

Victimisation. We calculated the overall pooled percentage for victimisation across all studies for each bullying type and each school level (Table 2 and supplementary Table 3). Overall victimisation rates for primary school (traditional and cyber combined) (22.4%; $z= -7.88$; 12 studies; $p<0.001$) were significantly higher than the rate for post-primary (traditional, cyber, homophobic and alterphobic

combined) [(11.8%; z= -14.76; 28 studies; p<0.001; Q_b (df:1) = 15.14; p<0.001)] even when excluding homophobic and alterphobic studies [Q_b (df:1) = 13.64; p<0.001]. It was also found that traditional victimisation in primary schools (26.1%) was significantly higher than post-primary [(12.4%; Q_b (df:1) = 15.14; p<0.001]. No significant differences for cyber victimisation were found between primary schools (13.7%) and post-primary schools (9.6%).

TABLE 2

When specific bullying types were investigated, traditional victimisation (26.1%; 9 studies; z= -7.45; p<0.001) was significantly twice as high as cyber victimisation (13.7%; 3 studies; z= -14.77; p<0.001) in primary schools [Q_b (df: 1) = 18.16; p<0.001]. Rates of cyber victimisation (9.6%; 7 studies; z= -10.40; p<0.001) were also less than traditional victimisation (12.4%; 16 studies; z= -10.42; p<0.001) at the post-primary level but the differences were not significant [Q_b (df: 1) = 1.00; p=0.316].

The heterogeneity for the entire primary school sample [Q (df: 11) = 3109; p<0.001; I-squared=99.65)] and post-primary sample [Q (df:26) = 6312; p<0.001; I squared: 99.57)] were significant.

Moderator Variables. Prevalence rates varied greatly and significantly when separated for the type of assessment used (see Table 2). In the primary sample, a pooled estimate of 23.9% was reported for traditional victimisation for studies using the OBQ and 26.6% for OBQ modified, whereas a significantly higher rate was reported when specific questions were asked that required a simple Yes/No answer [(40%) (Q_b (df:2) = 19.49; p<0.001)]. Similarly, there were significant differences in prevalence rates for traditional victimisation for coded responses [(Q_b (df:5) = 1041.57; p<0.001)], even when studies used the same scale (standard five point likert

scale) but included particular answers as being representative in victimisation. A similar pattern was found for traditional bullying in post-primary pupils [(Q_b (df:6) = 68.22; p<0.001)].

The time frame reported in these studies ranged from 'two months' to 'ever'. In general, this differed significantly across studies for both primary and post-primary pupils. For example, in primary schools, the larger the time frame students were asked about, the higher the percentage of traditional victimisation [(2 months: 20.8%; 3 months: 26.6%; current school term: 30.7%; 12 months: 40%); (Q_b (df:3) = 12.63; p<0.01)]. In terms of gender, there was a significant effect for cyber victimisation in primary schools, however this was based on a group with one study only (separate results for boys and girls) whereas boys (15%) and mixed gender groups (combined boys and girls;15.5%) had higher cyber victimisation rates compared to girls alone [(11%) (Q_b (df:2) = 33.85; p<0.001)]. There was no difference in victimisation prevalence rates across the sample for whether a definition was included or not.

Bullying Perpetration. We calculated the overall pooled percentage for bullying across all studies for each bullying type and each school level (Table 3 below and Supplementary Table 4). Overall bullying rates (traditional and cyber combined) for primary school (9.4%; z= -8.7; 10 studies; p<0.001) were not significantly higher than the rate for post-primary [6.1%; z= -15.88; 22 studies; p<0.001; Q_b (df: 1) = 2.16; p=0.142]. Traditional bullying in primary (10.1%; z= -7.74; 9 studies; p<0.001) was higher than post-primary (6.9%; z= -11.38; 12 studies; p<0.001), however this difference was not significant [Q_b (df: 1) = 1.28; p=0.258]. Cyber perpetration rates were similar across both school types (5.2% and 3.9% respectively).

TABLE 3

When specific bullying types were investigated, traditional bullying (10.1%; 9 studies; z= -7.74; p<0.001) was significantly twice as high as cyber (5.2%; 1 study; z= -30.23; p<0.001) in primary schools [Q_b (df: 1) = 5.76; p<0.05]. Rates of cyber perpetration (3.9%; 6 studies; z= -16.24; p<0.001) were also significantly less than traditional victimisation (6.9%; 12 studies; z= -11.38; p<0.001) at post-primary [Q_b (df: 1) = 3.90; p<0.05].

The heterogeneity for the entire primary school sample [Q (df: 9) =5127; p<0.001; I-squared=99.82] and post-primary sample [Q (df:21) = 4640.43; p<0.001; I squared: 99.55] were significant.

Moderator Variables. Prevalence rates varied greatly and significantly when separated for the type of assessment used (see Table 3). In the primary sample, a pooled estimate of 11.3% was reported for traditional bullying for studies using the OBQ, 6.2% for a modified version of OBQ and 13% for the specific question scale [Q_b (df:2) = 5.95; p=.05]. There was a significant difference for prevalence of traditional bullying in post-primary schools. For example, the rate of prevalence when the OBQ was used was 7.1%, 4.1% for the modified OBQ and 4.9% for specific question scale [Q_b (df:3) = 20.33; p<0.001]. Similarly, there were significant differences in prevalence rates for traditional bullying for coded responses [Q_b (df:5) = 228.87; p<0.001] in primary and in post-primary [Q_b (df:6) = 85.72; p<0.001].

The larger the time frame students were asked about, the higher the percentage of overall bullying (traditional and cyber combined) [Q_b (df:3) = 11.53; p<0.01]. The time frame was also significant for cyber perpetration in post-primary schools [Q_b (df:2) = 19.53; p<0.001]. There was a significant effect for gender in post-primary for cyberbullying where boys had higher prevalence of cyberbullying compared to girls and mixed samples [Q_b (df:2) = 7.41; p<0.05]. The inclusion of a

definition had a significant effect on cyber perpetration in the post-primary samples and studies who did not include a definition significantly reported higher cyberbullying rates compared to studies that did [Q_b (df:1) = 7.29; $p<0.01$].

Publication Bias. The Begg and Mazumdar Rank Correlation Test (correlation between study size and effect size) suggest no evidence for publication bias for studies that investigated victimisation and bullying others. A failsafe N and the "5k + 10" benchmark were calculated. For victims, the fail-safe N was 38,939, which exceeded the benchmark (5k + 10= 210) suggesting no evidence of publication bias. For bullies, the fail-safe N was 372,081 which also exceeded the benchmark (5k + 10= 170) suggesting no evidence of publication bias.

Psychological correlates.

A range of psychological correlates was reported across the studies but in general they were related to self-esteem, life satisfaction, psychological well-being and mental health. However, other factors like friendship and family relations were also investigated (N=10).

In one of the earliest studies, O'Moore and Kirkham (2001) found that primary and post-primary victims of bullying had significantly lower global self-esteem than their non-victim peers. This self-esteem was lowest for children who reported being frequently victimised (once a week and once a day). This study also found that pure victims had significantly higher global self-esteem than victims who also bullied others (bully/victims). Significantly lower self-esteem was also reported for participants who bullied others compared to neutrals and again, it was lowest for those who did so "frequently".

More recently, Callaghan et al. (2015) found that victimisation of any type of

bullying was associated with poorer health and lower life satisfaction among secondary school students. This effect was particularly strong in relation to traditional bullying and was stronger among girls compared to boys. Devine and Lloyd (2012) found similar results in their Northern Irish sample of primary students (10-11 years) who had significantly poorer psychological well-being than their peers when exposed to cyberbullying. McGuckin (2010) also found that there were significant associations between victimisation and poorer psychological well-being for a sample of 16 year olds in Northern Ireland.

Dyer and Teggart (2007) investigated the relationship between previous experiences of bullying and attendance at the Child and Adolescent Mental Health Service and found that 62.5% of the participants said that previous bullying experiences played a moderate to very important role in their attendance at the clinic. In addition, McMahon, Reulbach, Keeley, Perry and Arensman (2010) found that boys who had been bullied at school were more anxious and depressed and had poorer self-esteem than those without a history of bullying victimisation. In particular, they found that victimisation was associated with increased thoughts of self-harm when compared to those without such histories. Furthermore, James, Sofroniou and Lawlor (2003) reported that 38% of their sample of secondary school students (N=1,068) felt depressed and 21% expressed suicidal thoughts when exposed to bullying.

Several other psychological factors were investigated across the studies, mostly as secondary objectives to investigations of prevalence rates and/or interventions. For example, O'Moore (2012) found gender differences in the reactions of 12-16 year olds to cyberbullying and found that girls were more likely to feel upset and frightened, while more boys expressed anger than girls. Ging and O'Higgins Norman (2016) also reported feelings of upset after online interactions for 53% of

their sample of adolescent girls. In addition, Connolly and O'Moore (2003) investigated the personality of bullies and found that child bullies exhibited greater emotional inhibition and attributed significantly more negative statements to themselves than children who did not bully others. Friendship seemed to be a resilience factor buffering against victimisation. Collins, McAleavy and Adamson (2004) found a greater likelihood for pupils with fewer friends to be harassed by peers, with a greater percentage reporting more frequent forms of bullying than pupils with a larger number of friends.

Interventions

Intervention strategies were limited in this context (N=7) and all appeared to target bullying in general, with little emphasis on the different types. A handful of studies conducted analyses of educational and whole-school anti-bullying initiatives and their impact on prevalence rates, and fewer still looked at psychological or individualised interventions (Table 4).

TABLE 4

O'Moore and Minton (2005) reported an anti-bullying intervention that resulted in significant reductions of victimisation over the course of one year, while Minton and O'Moore (2008) report findings from the Anti-Bullying Centre's anti-bullying programme (2004-2006) and found significant reductions in post-primary school children's reports of bullying in the previous three months and secondary school pupils' reports of bullying in the previous five days. In addition, Minton, O'Mahoney and Conway-Walsh (2013) reported results from the Erris Anti-bullying Initiative (2009-2011) and found non-significant reductions in the frequency of involvement in bullying amongst primary school students.

James et al. (2006) reported on the cool-school anti-bullying program, which was administered in one school. Students reported feelings of increased safety and decreased bullying after the intervention although no objective measure of bullying rates was implemented to investigate its impact. Similarly, O'Higgins Norman, Goldrick and Harrison (2009) delivered a pilot programme aimed at reducing homophobic bullying in a co-educational post-primary school. The study gathered pre- and post- intervention levels of homophobia among students and the results showed a marginal increase in knowledge and increased empathy among males after exposure to the intervention.

A more recent study conducted in Northern Ireland, by McElearney, Adamson, Shevlin and Bunting (2013) investigated the utility of a counselling service over the course of one year in a mixture of 43 primary and secondary schools across Northern Ireland. Results revealed a significant decrease in scores on the Strengths and Difficulties Questionnaire (SDQ) for the students who attended the counselling sessions. In an earlier study, McElearney, Roosmale-Cocq, Scot and Stephenson (2008) investigated a peer support program in a primary school in Ireland but did not empirically evaluate its utility.

Discussion

The results presented here demonstrate the almost fickle nature of our prevalence rates across studies on the island of Ireland. It shows quite apparently that these can be influenced by a range of factors, which often vary from one study to the next. These include methods of data collection, the answer scales, whether the study included a definition of bullying or not, and time frame for each tool. Although we were able to establish a pooled estimate of prevalence rate, the moderator variables showed that these rates need to be interpreted with extreme caution. That said, the

CMA analysis did allow us to deduce overall prevalence rates for victimisation and perpetration for each school type, method of assessment, time frame and answer scale. At the very least, this gives us a tentative figure which we can draw general conclusions about Irish students (Republic and Northern Irish) and how they compare to others worldwide. We can also use this figure to determine differences across the school stages (primary and post-primary) and between the Republic of- and Northern Ireland.

Prevalence of victimisation (all types combined) in primary school (22.4%) and post-primary (12.1%) across the island of Ireland. This rate was lower for bullying perpetration in primary (9.4%) and post-primary (6.1%). Cyberbullying involvement appeared to be lower when compared to traditional bullying, a finding which has been reported elsewhere (e.g., Modecki et al., 2014). The range of cyber victimisation rates is within the worldwide average (10-40%; see Kowalski, Giumetti, Schroeder & Lattanner, 2014). In contrast, the range of cyberbullying perpetration appears smaller than international comparisons. Hinduja and Patchin (2009) reported that 9% of the sample of middle school students were cyber bullies, which is higher than our figure of 5.2% (primary) and 3.9% (post-primary). There have been some arguments in the literature that rates of involvement in cyberbullying are on the increase. This is an important factor to consider in light of the current results, which reports only one recent paper on cyberbullying (e.g., Purdy and York, 2016). The rapid developments in technology, as well as the increase in social networking sites, and mobile phones usage suggest that a new investigation of prevalence rates of cyberbullying in Ireland is well over due.

The obvious moderator and measurement issues are key methodological concerns for local and international investigations of bullying. Indeed, researchers

often define bullying using the definition by Olweus (1991) but we need to consider the possibility that meaning could vary between research and applied settings, not to mention between the students' unique understandings. One Irish study by Byrne, Dooley, Fitzgerald and Dolphin (2016) found that students defined bullying with alternative concepts of 'mean', affecting feelings and having different forms/types. This study also highlighted the differences in experience as a factor in how it was defined. For example, older females and identified victims of bullying were more likely to consider the psychological impact. This highlights a very important issue for how we implement awareness campaigns in schools and suggests that we need to work on the relevance of research and its' practical applications.

Moving forward, the most advantageous approach would be to work towards developing a more united and standardised approach to the investigation of bullying behaviour. For example, an appropriate time frame could be agreed for research purposes. Furthermore, standards, in terms of reporting methods and results (e.g., the inclusion or exclusion of a definition) should be encouraged for researchers reporting in this field. Indeed, without these basic guidelines, comparisons between Northern Ireland and the Republic of Ireland, and internationally are near impossible.

While not included in this review, it is worth noting a small number of important studies that have looked specifically at anti-bullying policies and the impact on bullying when they were utilized in a school setting. For example, Corcoran and Mc Guckin (2014) administered questionnaires to members of the National Association of Principals and Deputy Principals and found that all respondents implemented anti-bullying policies in their respective schools. Furthermore, a recent content analysis of anti-bullying policies in Northern Ireland found that most schools included reference to physical, verbal, relational, and cyberbullying. However, only a

minority mentioned racist, homophobic, sexual, adult/teacher–pupil bullying or bullying related to disability or religion (Purdy & Smith, 2016). Similar results were reported in an earlier study in the Republic of Ireland where 63% of secondary school teachers reported that their schools' anti-bullying policy was void of any reference to LGBT issues (O'Higgins Norman, 2008). A recent systematic review revealed that anti-bullying policies might be effective at reducing bullying if their content is based on research and theoretical evidence and if they are implemented with a high level of fidelity (Hall, 2017). However, more research is needed in this area to improve anti-bullying policies according to new research developments.

To date, anti-bullying interventions have been predominately education-based. While worthwhile and necessary, these studies present only a small portion of the problem and are lacking psychological analyses in terms of the impact on the mental health of our young people. For example, there were no studies which focused on other associated problems and/or externalizing behaviour such as conduct problems, truancy or academic achievement, despite these being found to be significantly correlated to bullying in other countries (Hammig & Jozkowski, 2013). In addition, the factors that make some students resilient to these stresses (e.g., caring friendships) are extremely important if we are to develop interventions that promote adaptive and proactive coping styles. Indeed, it is necessary to distinguish between educational and preventative measures (e.g. anti-bullying policies) and psychological interventions that are normally designed to provide support to victims based on their individual coping styles (Foody, Samara, & Carlbring, 2015). Only then we will be able to account for and aid each child's individualized reaction to victimisation.

There have been some noteworthy developments at governmental levels. The National Action Plan on bullying was developed in 2013 by the Department of

Education and Skills in the Republic of Ireland with the goal of requiring schools to develop anti-bullying policies. Specific anti-bullying procedures for schools were published which provided a definition of bullying, information on the impact and characteristics of the behaviour and a template for schools to develop their own anti-bullying policies. More recently, the Northern Ireland assembly published an Act for addressing bullying in schools (NIA 71/11-16). This Act which will likely come into place in September 2017, includes a definition of bullying and sets requirements for the Boards of Governors to record, report and take preventative action against bullying in schools (Purdy, 2016). The utility and impact of this Act have yet to be determined and more research and evaluations are necessary to see if legislating for bullying plays a preventative role (El Asam & Samara, 2016; Foody et al., 2017). Although these provide a positive step in the right direction, they are by no means exhaustive efforts in combating bullying and they clearly present challenges (e.g., resources and training for schools) that have yet to be worked out.

Indeed, policy development could come from looking at other countries where more extensive research has been conducted in the area. For example, in England and Northern Ireland it is a legal requirement to have an anti-bullying policy in schools (Purdy & Smith, 2016; Smith & Samara, 2003), the effectiveness of which has been studied over time (Smith et al., 2008; Smith et al., 2012). Samara and Smith (2008) investigated schools' use of these strategies in the UK, the effect of required legal policies and the anti-bullying pack provided by the government in 1996 and 2002. They found that most schools moved from having a bullying policy as part of a broader policy on behaviour and discipline, to having a separate anti-bullying policy.

Based on the analyses performed here, there is no evidence of publication bias either for study size or the number of studies published on bullying others and

victimisation in general. While some large-scale studies in Northern Ireland (e.g., McGuckin et al., 2008) and the Republic of Ireland (e.g., O'Moore et al., 1997) do exist, current and contemporary studies that take into account the changing face of bullying (e.g., specific forms such as homophobic) and between whom it happens (e.g., sibling; Wolke & Samara, 2004) are lacking. So too, are longitudinal studies which outline the effects of bullying overtime and in a manner that permits us to draw comparisons between different locations, subgroups and gender.

Of course, all of these investigations will only be considered appropriate if they make strong allowances for the methodological difficulties inherent in such studies. It is imperative that moving forward we consider the need for a shared and standard understanding of what bullying is in terms of both research and in applied settings (e.g., schools). Only then can we really compare between countries and cultures. The results presented here demonstrate the need for caution when investigating prevalence rates and show specifically that the tools, time frame, answer scale codes and definitions all impact the final outcome. This is quite significant when one considers how easily we make cultural and international comparisons and if anything, emphasises the need for caution when interpreting these figures.

Moving forward we also feel it imperative to be as specific as possible when reporting results from various cultures and countries globally. Indeed, any studies which have not specifically noted the uniqueness of Northern Ireland in this regard may be limited (see McGuckin, 2013). If there is room for variance in terms of prevention and intervention strategies, then we would also argue that there might be variance in prevalence and even types of bullying. Despite this, we also note the importance of comparing and contrasting bullying issues in Northern- and the Republic of Ireland and feel that this is a worthwhile endeavour in the future. If

anything, it may promote the use of standardised tools and measurement methods which are urgently needed.

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Table 1.
Overview of studies found in the systematic review.

Study	Age/year	N	School type	Location	Bullying Type	Participants	Category
Byrne et al. (2016)	12-19 years	4358	Post-primary	Republic of Ireland	Traditional	n/a	Definition of bullying
Callaghan et al. (2015)	15-18 years	318	Post-primary	Republic of Ireland	Cyber and Traditional	Victims	Prevalence; Psychological impact
Collins et al. (2004)	Year 6 Year 8	2432	Post-primary and primary	Northern Ireland	Traditional	Bullies and victims	Prevalence; Friendship
Connolly & O'Moore (2003)	6-16 years	228	Post-primary and primary	Republic of Ireland	Traditional	Bullies	Family relations; Personality
Corcoran et al. (2012)	12-16 years	876	Post-primary	Republic of Ireland	Traditional and Cyber	Bullies and victims	Prevalence, personality and self-concept
Cotter & McGilloway (2011)	12-18 years	122	Post-primary	Republic of Ireland	Cyber	Victims and bullies	Prevalence
Devine & Lloyd (2012)	10 and 11 years	3657	Primary	Northern Ireland	Cyber	Victims	Prevalence; psychological impact
Dyer & Teggart (2007)	12-17 years	26	CAMHS service users	Northern Ireland	Traditional	Victims	Prevalence; Psychological impact
Gavin et al. (2015)	10-17 year	13611	Post-primary and primary	Republic of Ireland	Traditional and Cyber	Bullies and victims	Prevalence
Ging & O'Higgins Norman (2016)	14-17 years	116	Post-primary	Republic of Ireland	Cyber	n/a	Gender

Guerin & Hennessy (2002)	10-13 years	166	Primary	Republic of Ireland	Traditional	n/a	Definition
James et al. (2006)	12-18 years	174	Post-primary	Republic of Ireland	Traditional	n/a	Intervention
James et al. (2003)	2nd year	1068	Post-primary	Republic of Ireland	Traditional	Victims	Prevalence; Psychological impact
Livesey et al. (2007)	Year 6 and Year 9	2312	Post-primary and Primary	Northern Ireland	Traditional	Victims and bullies	Prevalence
McClure Watters (2011)	Year 6 and Year 9	2201	Post-primary and Primary	Northern Ireland	Traditional and cyber	Victims and bullies	Prevalence
McElearney et al. (2013)	Mean age =12.5 years	202	Post-primary and primary	Northern Ireland	Traditional	n/a	Intervention
McElearney et al. (2008)	Year 7	n/a	Primary	Northern Ireland	Traditional	n/a	Intervention
McGuckin (2010)	16 years	819	Child Benefit Register	Northern Ireland	Traditional	Bullies and victims	Prevalence; Psychological impact
McGuckin et al. (2008)	Years 8-12 (11-16 years)	6297	Post-primary	Northern Ireland	Traditional	Victims	Prevalence
McGuckin et al. (2009)	11-16 years	7223	Post-primary	Northern Ireland	Traditional	Victims	Prevalence; Psychological impact
McGuckin & Lewis (2006)	12- 17 years	397	Post-primary	Northern Ireland	Traditional	n/a	Policy
McMahon et al. (2010)	15-17 years	1870 Boys	Post-primary	Republic of Ireland	Traditional	Victims	Prevalence; Psychological

							Impact
McNamee et al. (2008)	16 years	819	Child benefit register	Northern Ireland	Homophobic	Victims	Prevalence; Psychological Impact
Minton (2010)	8-16 years	5569	Post-primary and primary	Republic of Ireland	Traditional	Victims	Prevalence; Gender
Minton (2012)	16-17 years	820	Post-primary	Republic of Ireland	Alterophobic	Victims	Prevalence
Minton (2014)	13-17 years	1036	Post-primary	Republic of Ireland	Homophobic	Victims	Prevalence
Minton et al. (2008)	15-31 years	90	LGBT Post-primary	Republic of Ireland	Homophobic	Victims	Prevalence
Minton et al. (2013)	8-15 years	290	Post-primary and Primary	Republic of Ireland	Traditional	n/a	Intervention
Minton & O'Moore (2008)	8-16 years	68 schools	Post-primary and Primary	Republic of Ireland	Traditional	n/a	Intervention
O'Higgins Norman et al. (2009)	16-18 years	22	Post-Primary	Republic of Ireland	Homophobic	n/a	Intervention
O' Moore (2012)	12-16 years	3004	Post-primary	Republic of Ireland	Traditional and Cyber	Victims and bullies	Prevalence; Psychological impact
O' Moore & Kirkham (2001)	8-18 years	8249	Post-primary and primary	Republic of Ireland	Traditional	Victims	Psychological impact
O' Moore et al. (1997)	8-18 years	20442	Post-primary and	Republic of Ireland	Traditional	Victims and bullies	Prevalence

			Primary				
O' Moore & Minton (2005)	8-16 years	22 schools	Primary	Republic of Ireland	Traditional	n/a	Intervention
O'Neill & Dinh (2015)	9-16years	500	Post-primary and Primary	Republic of Ireland	Traditional and Cyber	Victims	Prevalence
O'Neill et al. (2011)	9-16 years	994	Post-primary and primary	Republic of Ireland	Traditional and Cyber	Victims and bullies	Prevalence
Purdy & York (2016)	Years 9, 11 and 13	425	Post-primary	Northern Ireland	Cyber	Victims and bullies	Prevalence
Walsh et al. (2015)	11, 13 and 15 years	4574	Post-primary	Republic of Ireland	Traditional	Victims and bullies	Prevalence
Williams et al. (2009)	9 year olds	8579	Primary	Republic of Ireland	Traditional	Bullies and victims	Prevalence

Table 2. Overall and Moderator Analysis: School type by victimisation type and moderators

	Primary Schools			***Post-Primary Schools***					
	Victimisation			**Victimisation**					
Moderator	**Traditional (26.1%; 9 studies; p<0.001)**	**Cyber (13.7%; 3 studies; p<0.001)**	**Total (22.4%; 12 studies; p<0.001)**	**Traditional (12.4%; 16 studies; p<0.001)**	**Cyber (9.6%; 7 studies; p<0.001)**	**Homophobic (12.6%; 2 studies; p<0.05)**	**Alter phobic (6%; 1 study; p<0.001)**	**Trad. And Cyber (18.5% (2 studies)**	**Total (11.8%; 28 studies; p<0.001)**
Assessment Tool									
OBQ	23.9% (N:6)*	15.5% (N: 1)	22.5% (N: 7)	10.9% (N: 6) **	17% (N: 1)*				11.7% (N: 7)*
CBQ				6.1% (N: 1)**	5.3% (N: 1)*				5.7% (N:2)*
OBQ modified	26.6% (N:2)*		26.6% (N: 2)	18.3% (N: 3)**					18.3% (N: 3)*
CBQ modified					10.5% (N:2)*			18.5% (N: 2)	14% (N: 4)*
Specific Questions	40% (N: 1)*	12.9 (N:2)	19.6% (N: 3)	12.9% (N: 6)**	13% (N: 2)*	12.6% (N: 2)	6% (N: 1)		12.1% (N: 11)*
Not Provided					3.8% (N: 1)*				3.8% (N: 1)*
Significant moderator influence (tools)	*Q(df:2)=19.49; p<0.001*			*Q(df:3)=11.47; p<0.01*	*Q(df:4)=98.79; p<0.001*				*Q(df:5)=35.35; p<0.001*
Coded Answers									
3-5 (Standard Five)	17.1% (N:2)*		17.1% (N:2)**	8.7% (N: 3)*					8.7% (N: 3)*
2-5 (Standard Five)	30.7% (N:2)*		30.7% (N:2)**	15.5% (N:3)*	10.4% (N: 3)			18.5% (N: 2)	14.1% (N: 8)
4-5 (Standard Five)	15% (N:1)*		15% (N:1)**	3% (N: 1)*					3% (N: 1)*
Scale type 2[+]	26.6% (N:2)*		26.6% (N:2)**	22.9 (N: 2)*					22.9 (N: 2)*
Scale type 3[#]				8.7% (N: 2)*					8.7% (N: 2)*
Scale type 4[Ψ]						9.6% (N: 1)***	6% (N: 1)		7.6% (N: 2)*
Yes (Yes/No answer)	40% (N: 1)*	12.9% (N: 2)	19.6% (N:3)**	16.2% (N: 3)*	17.2% (N: 1)				16.4% (N: 4)*

Not Provided	39% (N:1)*	15.5% (N:1)	25.5% (N:2)**	14% (N: 2)*	7.2% (N: 3)	17.8% (N: 1)***	6% (N: 1)		10.6% (N: 6)*
Significant moderator influence (answers)	*Q(df:5)=1041.57; p<0.001*		*Q(df:5)=19.06; p<0.01*	Q(df:6)=68.22; p<0.001		*Q(df:1)=5.88; p<0.05*			*Q(df:7)=89.04; p<0.001*
Time Frame									
2 months	20.8% (N:4)**	15.5% (N:1)	19.7% (N:5)*	9.4% (N: 7)*	9.8% (N: 5)*			18.5% (N: 2)	10.5% (N: 14)
3 months	26.6% (N:2)**		26.6% (N: 2)*	15.3% (N: 3)*	5.3% (N: 1)*	17.8% (N: 1)***			12.8% (N: 5)
Current school term	30.7% (N:2)**		30.7% (N:2)*	14.4% (N: 3)*					14.4% (N: 3)
12 months	40% (N: 1)**		40% (N:1)*	8.8% (N: 2)*					8.8% (N: 2)
Ever		12.9% (N: 2)	12.9% (N:2)*		17.2% (N: 1)*				17.2% (N: 1)
Not Provided				43.3% (N: 1)*		9.6% (N: 1)***	6% (N:1)		14.8% (N: 3)
Significant moderator influence (timeframe)	*Q(df:3)=12.63; p<0.01*		*Q(df:4)=86.52; p<0.001*	Q(df:4)=75.68; p<0.001	Q(df:2)=22.88; p<0.001	Q(df:1)=5.88; p<0.05			
Gender									
Girls	21.5% (N:2)	11% (N:1)*	17.3% (N:3)	8.2% (N: 3)	15.6% (N: 1)			14.8% (N: 1)*	11.6% (N: 5)
Boys	25.1% (N:2)	15% (N:1)*	21.3% (N: 3)	10% (N: 4)	6.9% (N: 1)			22.8% (N: 1)*	10.1% (N: 6)
Mixed	28.4% (N:5)	15.5% (N:1)*	25.9% (N: 6)	15.6% (N: 9)	9.2% (N: 5)	12.6% (N: 2)	6% (N: 1)		12.5% (N: 17)
Significant moderator influence (gender)		*Q(df:2)=33.85; p<0.001*						*Q(df:1)=61.51; p<0.001*	
Definition of bullying									
Yes	26.2% (N:7)	15.5% (N:1)	24.6% (N: 8)	12.9% (N: 11)	8.6% (N: 5)	9.6% (N: 1)***	6% (N: 1)	18.5% (N: 2)	11.5% (N: 20)
No	25.6% (N:1)	12.9% (N:2)	18.4% (N: 4)	11.5% (N: 5)	13% (N: 2)	17.8% (N: 1)***			12.6% (N: 8)
Significant moderator influence (definition)					*Q(df:1)=5.88; p<0.05*				

Standard five answer options: 1. I have not been bullied; 2. once or twice; 3. 2 or 3 times a month; 4. once a week; 5. several times a week.
+Answer options= Not at all, now and again, once a week, once a day (2-4: involved)
Ψ Answer options= Never, seldom, two or three times a month, about every week, about every day (3-5: involved)
#Answer options=Not at all, it has happened once or twice, 2-3 times a month, several times a week (involved: 3-4)
*p<0.000; **p<0.01; ***p<0.05

Table 3. Overall and Moderator Analysis: School type by bullying others type and moderators

	Primary Schools			***Post-Primary Schools***					
	Bullying Others			**Bullying Others**					
Moderator	**Traditional (10.1%, 9 studies; p<0.001)**	**Cyber (5.2%;1 study; p<0.001)**	**Total (9.4%; 10 studies; p<0.001)**	**Traditional (6.9%%; 12 studies; p<0.001)**	**Cyber (3.9%%; 6 studies; p<0.001)**	**Homophobic (10%; 1 study; p<0.05)**	**Alter phobic (4.6%; 1 study; p<0.001)**	**Trad. And Cyber (9.4% (2 studies)**	**Total (6.1%; 22 studies; p<0.001)**
Assessment Tool									
OBQ	11.3% (N: 6)***	6.2% (N: 1)	10.1% (N: 7)***	7.1% (N: 6)*	6.6% (N: 1)*				7% (N: 7)*
CBQ				4.1% (N: 1)*	1.6% (N: 1)*				2.6% (N: 2)*
OBQ modified	6.2% (N: 2)***		6.2% (N: 2)***	13.4% (N: 2)*					13.4% (N: 2)
CBQ modified					4.2% (N: 2)*			9.4% (N: 2)	6.3% (N: 4)*
Specific Questions	13% (N: 1)***		13% (N: 1)***	4.9% (N: 3)*	9% (N: 1)	10% (N: 1)	4.6% (N:1)		5.9% (N: 6)*
Not Provided					1.4% (N: 1)*				1.4% (N: 1)*
Significant moderator influence (tools)	*Q(df:2)=5.95; p=.05*		*Q(df:2)=6.49; p=.05*	*Q(df:3)=20.33; p<0.001*					*Q(df:5)=30.39; p<0.001*
Coded Answers									
3-5 (Standard Five)	4.4% (N: 2)*		4.4% (N: 2)*	2.7% (N: 2)*					2.7% (N: 2)*
2-5 (Standard Five)	25% (N: 2)*		25% (N: 2)*	15% (N: 2)*	4.2% (N: 2)***			9.4% (N: 2)	8.5% (N: 6)*
4-5 (Standard Five)	6% (N: 1)*		6% (N: 1)*	3% (N: 1)*					3% (N: 1)*
Scale type 2^{+}	6.2% (N: 2)*		6.2% (N: 2)*	13.4% (N: 2)*					13.4% (N: 2)*
Scale type $3^{\#}$				3.7% (N: 2)*					3.7% (N: 2)*
Scale type 4^{Ψ}						10% (N: 1)	4.6% (N:1)		6.9% (N: 2)*
Yes (Yes/No answer)	13% (N: 1)*		13% (N: 1)*	8.1% (N: 1)*	9% (N: 1)***				8.1% (N: 2)*

Not Provided	21% (N: 1)*	6.2% (N: 1)	10.8% (N: 2)*	9.7% (N: 2)*	2.6% (N: 3)***				4.5% (N: 5)*
Significant moderator influence (answers)	*Q(df:5)=228.87; p<0.001*		*Q(df:5)=98.98; p<0.001*	*Q(df:6)=85.72; p<0.001*	*Q(df:2)=6.43; p<0.05*				*Q(df:7)=85.48;p<0.001*
Time Frame									
2 months	7.2% (N: 4)***	6.2% (N: 1)	6.8% (N: 5)**	4.4% (N: 6)	4.1% (N: 4)*			9.4% (N: 2)	4.7% (N: 12)
3 months	6.2% (N: 2)***		6.2% (N: 2)**	9.5% (N: 3)	1.6% (N: 1)*				6.5% (N: 4)
Current school term	25% (N: 2)***		25% (N: 2)**	15% (N: 2)					15% (N: 2)
12 months	13% (N: 1)***		13% (N: 1)**	8.1% (N: 1)					8.1% (N: 1)
Ever					9% (N: 1)*				9% (N: 1)
Not Provided						10% (N: 1)	4.6% (N:1)		6.9% (N: 2)
Significant moderator influence (timeframe)	*Q(df:3)=10.31; p<0.05*		*Q(df:3)=11.53; p<0.01*		Q(df:2)=19.53; p<0.001				
Gender									
Girls	7% (N: 2)		7% (N: 2)	3.2% (N: 3)	3.5% (N: 1)***			5.6% (N: 1)*	3.7% (N: 5)
Boys	17% (N: 2)		17% (N: 2)	8.9% (N: 3)	4.9% (N: 1)***			15.3% (N: 1)*	8.9% (N: 5)
Mixed	9.3% (N: 5)	6.2% (N: 1)	8.4% (N: 6)	8.8% (N: 6)	3.6% (N: 4)***	10% (N: 1)	4.6% (N:1)		6.5% (N: 12)
Significant moderator influence (gender)					*Q(df:2)=7.41; p<0.05*			*Q(df:1)=140.36; p<0.001*	
Definition of bullying									
Yes	10.4% (N: 7)	6.2% (N: 1)	9.6% (N: 8)	7.4% (N: 10)	3.4% (N: 5)**	10% (N: 1)	4.6% (N:1)	9.4% (N: 2)	6.1% (N: 19)
No	8.9% (N: 2)		8.9% (N: 2)	5% (N: 2)	9% (N: 1)**				6% (N: 3)
Significant moderator influence (definition)					*Q(df:1)=7.29; p<0.01*				

Standard five answer options: 1. I have not been bullied; 2. once or twice; 3. 2 or 3 times a month; 4. once a week; 5. several times a week.
+Answer options= Not at all, now and again, once a week, once a day (2-4: involved)
Ψ Answer options= Never, seldom, two or three times a month, about every week, about every day (3-5: involved)
#Answer options=Not at all, it has happened once or twice, 2-3 times a month, several times a week (involved: 3-4)
*p<0.000; **p<0.01; ***p<0.05

Table 4.
Overview of the studies investigating bullying interventions in schools.

Study	Target population	Intervention elements	Outcome
James et al. (2006)	Whole school	(1) Students faith in teachers (2) Teacher's ability to deal with bullying (3) Student's willingness and confidence in speaking to teachers (4) Feelings of safety at school (5) Parent education	72% of pupils felt safer at school
McElearney et al. (2008)	Befriending peer support program	(1) Training children as peer supporters (2) Training in: (a) setting ground rules; (b) team building; (c) questioning skills; (4) friendship	No outcomes measured
McElearney et al. (2013)	Independent School Counselling service	(1) Individually-based (2) Cognitive Behavioural Focus	Significant decrease in SDQ scores across time
Minton et al. (2013)	Whole-school	(1) Training network of professionals (2) Resource packs for teachers, parents and students (3) Community development emphasis	Non-significant reductions in prevalence
Minton & O'Moore (2008)	Whole -school	(1) Training network of professionals (2) Teacher's resource pack (3) Parent's resource pack (4)Working with pupils	Significant reduction in prevalence for particular age group and time frame
O'Higgins Norman et al. (2009)	Class-based	(1) Nature and Morality (2) Rights of gay and lesbian people (3) Church responsibilities to Gay and Lesbian People	General increase in positive attitudes to LGBT issues
O'Moore & Minton (2005)	Whole-school	(1) Training network of professionals (2) Teacher's resource pack (3) Parent's resource pack (4)Working with pupils	Significant reduction in prevalence

Supplement 1. PRISMA 2009 Checklist for the current study.

Section/Topic	#	Checklist Item	Reported on page
Title			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	Title page
Abstract			
Structured Summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	Abstract
Introduction			
Rationale	3	Describe the rationale for the review in the context of what is already known.	p.2-3
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	p.3 & p.4
Methods			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	n/a
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	p.4 & p.5
Information Sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	p.4
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Available if requested
Study Selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	p.4 and p.5
Data Collection Process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and	p.5

		confirming data from investigators.	
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	p.5
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	p.6
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	Table 2,3 and 4 (Supplementary Tables 2,3 and 4)
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	p.5-p.7
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	p.6-p. 7
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	p.5-7
Results			
Study Selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	p.5 and Table 1
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	Table 1 and Supplement Table 2
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	p.6
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	Table 1,2,and 3
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	Table 2 and 3 Supplement 3 and 4
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	p.12
Additional	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup	p.7-12

analysis		analyses, meta-regression [see Item 16]).n/a	
Discussion			
Summary of Evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	p.15-23
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	p.15, 16 and 20
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	p.15-21
Funding			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	Acknowledgements

Supplement 2. Overview of studies presenting prevalence rates.

Name	**Type**	**Def provided**	**Time frame**	**Tool used**	**Answers**	**Coded answers**	**Prev. victim**	**Prev. bully**
Callaghan, Kelly & Molcho (2015)	Trad. and cyber	N**	2 months	Specific questions	Standard five	Involved= 2-5	Post-primary Trad. (14%) Cyber (10%)	n/a
Collins, McAleavy & Adamson (2004)	Trad.	N**	2 months	OBQ	Standard five	Occasionally involved=2-3 Frequently involved= 4-5	Primary Occas. (26%) Freq. (15%) Post-primary Occas. (22%) Freq. (3%)	Primary Occas. (24%) Freq. (6%) Post-primary Occas. (26%) Freq. (3%)
Corcoran, Connolly & O'Moore (2012)	Trad. and cyber	Y	3 months	CBQ	Standard five	Not provided	Post-primary Trad. (6.1%) Cyber (5.3%)	Post Primary Trad. (4.1%) Cyber (1.6%)
Cotter & McGilloway (2011)	Cyber	Y	6 Months	CBQ	Standard five	Involved=2-5	Post-primary 17%	Post-primary 9%
Devine & Lloyd (2012)	Cyber	N**	Ever	Specific question	1. Yes 2. No	Involved=Yes	Primary Girls (11%) Boys (15%)	n/a
Dyer & Teggart (2007)	Trad.	N**	2 months	OBQ-modified	Standard five	Involved=2-5	CAMHS Service users 61.5%	n/a
Gavin et al. (2015)	Trad.	N**	2 months	Specific question	Not provided	Not provided	Primary and Post-primary Girls (27%) Boys (24%)	Primary and Post-primary Girls (9%) Boys (18%)
	Cyber	N**	2 months	Specific question	Not provided	Not provided	Mean messages Girls (17%) Boys (10%) Posting pictures Girls (19%) Boys (11%)	n/a
James, Sofroniou & Lawlor, (2003)	Trad.	Y	Current school term	OBQ-modified	Standard five	3-5	Post-primary **3.** (2.4%) **4.** (3.1%) **5.** (5.6%)	n/a

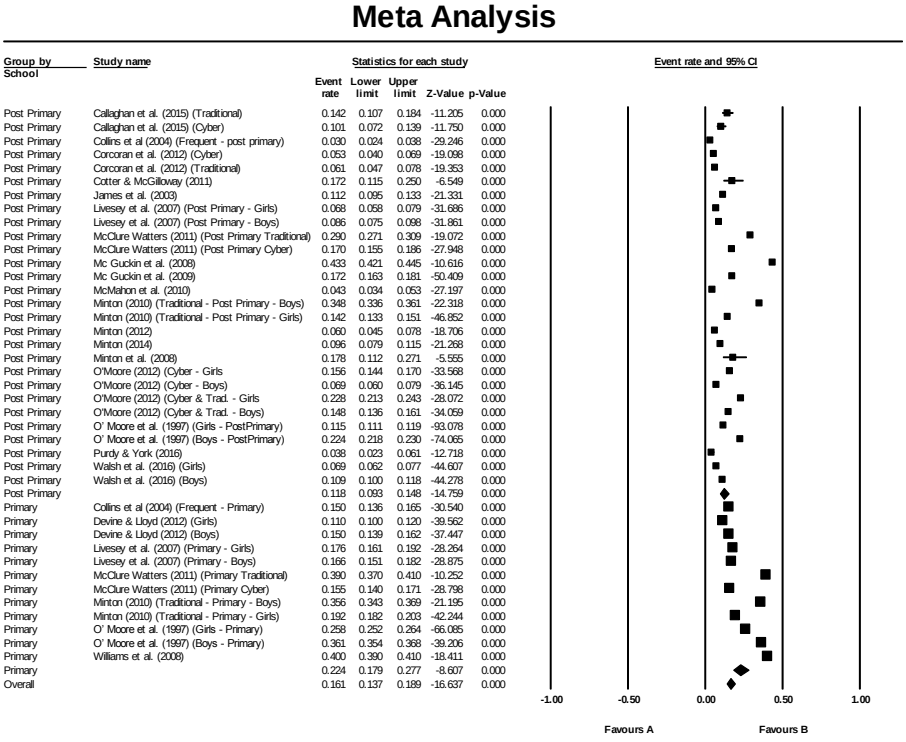
Livesey et al. (2007)	Trad.	Y	2 months	OBQ	Standard five	Involved=3-5	<u>Year 6</u> Girls (17.6%) Boys (16.6%) <u>Year 9</u> Girls (6.8%) Boys (8.6%)	<u>Year 6</u> Girls (2.7%) Boys (7.2%) <u>Year 9</u> Girls (1.7%) Boys (4.1%)
McClure Watters (2011)	Trad.	Y	2 months	OBQ	Standard five	Not provided	Year 6 (39%) Year 9 (29%)	Year 6 (21%) Year 9 (21%)
	Cyber	Y	2 months	OBQ and specific questions	Not provided	Not provided	Year 6 (15.5%) Year 9 (17%)	Year 6 (5.2%) Year 9 (6.6%)
Mc Guckin (2010)	Trad.	N**	2 months and ever	YBAS Questionnaire (specific questions)	**1.** A lot **2.** A little **3**. Not at all	Involved=Yes	<u>Post-primary</u> **1.** (3.7%) **2.** (24%) *Ever* (30.4%)	<u>Post-primary</u> **1.** (3.4%) **2.** (40.7%) *Ever* (7.5%)
Mc Guckin, Cummins & Lewis (2008)	Trad.	N**	Not mentioned	YPBAS questionnaire (specific questions)	**1.** Yes **2.** No	Involved=Yes	<u>Post-primary</u> 43.3%	n/a
Mc Guckin, Cummins & Lewis (2009)	Trad.	N**	12 months	Specific questions	**1.** Yes **2.** No **3.** Don't know	Involves=Yes	<u>Post-primary</u> 17.2%	Post-primary 8.1%
McMahon et al. (2010)	Trad.	N**	12 months	Specific question	**1.** Yes **2.** No	n/a	<u>Post-primary</u> (boys only): 4.3%	n/a
McNamee et al (2008)	Homophobic	N**	**(1)** At some time **(2)** 2months previous	Specific questions	Not provided	n/a	<u>Post-primary</u> **1.**(30.4%) **2.**(27.7%)	n/a
Minton (2010)	Several types	Y	3 months	OBQ-modified	**1.** Not at all **2.** Now and again **3.** About once a week **4.** About once a day	Involved=2-4	**Physical aggression* <u>Primary</u> Girls (19.2%) Boys (35.6%) <u>Post-primary</u> Girls (14.2%) Boys (34.8%)	<u>*</u>*Physical aggression* <u>Primary</u> Girls (4.5%) Boys (8.5%) <u>Post-primary</u> Girls (10.9%) Boys (16.4%)
Minton (2012)	Alteropbic	Y	Not provided	Specific questions	**1.** Never **2.** Seldom **3.** Two or three times per month **4.** About every	Involved=3-5	<u>Post-primary</u> 6%	<u>Post-primary</u> 4.6%

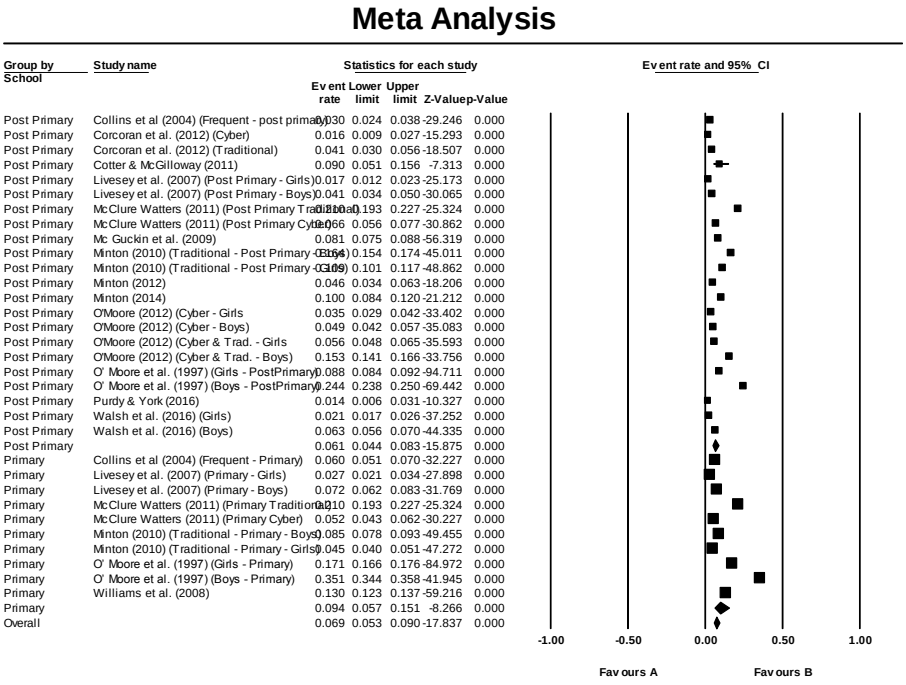
					week **5.** About every day			
*Minton (2014)	Homophobic	Y	Not provided	Specific questions	**1.** Never **2.** Seldom **3.**2-3 times per month **4.** About every week **5.** About every day	Not provided	2nd year **3**. (6.1%) **4.** (2.7%) **5.** (2%) Fifth year **3.** (4.4%) **4.** (2.9%) **5.** (1.1%)	2nd year **3.** (2.5%) **4.** (.2%) **5.** (.2%) Fifth year **3.** (3.6%) **4.** (1.7%) **5.** (1.3%)
Minton, Dahl, O' Moore & Tuck (2008)	Homophobic	N**	3 months	Specific questions	**1.**Not in last 3 months **2.** Now and again **3.**Once a week **4.**Once a day	Not provided	*Post-primary Frequent (17.8%)	n/a
O' Moore (2012)	Cyber	Y	2 months	OBQ-modified and CBQ	Standard five	Involved=2-5	Post-primary Girls (15.6%) Boys (6.9%)	Post-primary Girls (3.5%) Boys (4.9%)
	Trad. and/or cyber	Y	2 months	OBQ-modified and CBQ	Standard five	Involved= 2-5	Post-primary Girls (22.8%) Boys (14.8%)	Post-primary Girls (5.6%) Boys (15.3%)
O' Moore, Kirkham & Smith (1997)	Trad.	Y	Current school term	OBQ	Standard five	Involved= 2-5	Primary **2.** Girls (15.8%) Boys (21%) **3**. Girls (6.8%) Boys (9.9%) **4**. Girls (1.4%) Boys (2.3%) **5.** Girls (1.8%) Boys (2.9%) Post-primary **2.** Girls (8.4%) Boys (14.7%) **3.** Girls (2.1%) Boys (4.3%) **4.** Girls (.3%) Boys (1.2%) **5.** Girls (.7) Boys (2.2%)	Primary **2**. Girls (13.6%) Boys (25.8%) **3**. Girls (2.9%) Boys (7.1%) **4**. Girls (.3%) Boys (1.1%) **5.** Girls (.3%) Boys (1.1%) Post-primary **2.** Girls (7%) Boys (18.5%) **3.** Girls (1.5%) Boys (3.9%) **4.** Girls (.1%) Boys (.6%) **5.** Girls (.2%)

								Boys (1.4%)
O'Neill & Dinh (2015)	Trad. and cyber	Y	12 months	Specific question	**1.**Not bullied **2.**Victim of bullying but not upset **3.**Victim and a little upset **4.**Victim and very upset	Involved= 2-4	<u>Primary and post-primary</u> **2.** (6%) **3.** (12%) **4.** (6%)	n/a
O'Neill, Grehan & Ólafsson (2011)	Trad. and cyber	Y	12 months	Specific question	**1.**Not at all **2.** Less often **3.**Once or twice a month **4.**More than once a week	Involved= 2-4	<u>Primary and post-primary</u> Trad (4%) Cyber (15%)	<u>Primary and post-primary</u> 14% (cyber and trad. bullying)
Purdy & York (2016)	Cyber	Y	2 months	Not provided	Not provided	Not provided	<u>Post-primary</u> 3.7%	<u>Post-primary</u> 1.4%
Walsh et al. (2016)	Trad.	Y	2 Months	Specific question	**1.**Not at all **2**. It has happened once or twice **3.** 2-3 times a month **4**. several times a week	Involved=3-4	<u>Post-primary</u> Girls (6.9%) Boys (10.9%)	<u>Post-primary</u> Girls (2.1%) Boys (6.3%)
Williams et al. (2009)	Trad.	N**	12 months	Specific question	1.Yes 2.No	Yes=involved	<u>Primary</u> 40%	<u>Primary</u> 13%

CBQ: Cyberbullying Questionnaire. OBQ: Olweus Bullying Questionnaire.
Standard five answer options: 1. I have not been bullied; 2. once or twice; 3. 2 or 3 times a month; 4. once a week; 5. several times a week.
*More bullying types presented in the original report paper.
** The authors did not mention if a definition was provided.

Supplement 3. Meta-analysis plots for overall bullying victimisation



Meta Analysis

Supplement 4. Meta-analysis plots for overall bullying perpetration