



# Bullying and Cyberbullying in Adolescents: A Meta-analysis on the Effectiveness of Interventions

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## Introduction

Bullying and cyberbullying are considered important risk factors for the mental health of adolescents due to its association with numerous problems of psychosocial adjustment on a personal, interpersonal, and school level [1, 2]. In the last years, many interventions programmes have been developed and implemented with the purpose of reducing bullying and cyberbullying. Although there are several meta-analyses studying the effectiveness of these programmes, no meta-analytic review jointly analyses the effectiveness of interventions on both types of bullying. Consequently, the objective of this chapter is to compare together the effectiveness of the intervention programmes in the prevention of bullying and cyberbullying towards the perpetrator and the victim.

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## Bullying: Definitions and Types

First, bullying exists when a person or group repeatedly exposes an individual (or group) to negative actions. Second, such acts must be carried out with the intention of damaging or attacking. Finally, intimidation is based on an inequality of forces between the victim and the aggressor; usually the victim is weaker or has less power than the perpetrator [3–5].

Bullying can be carried out in different ways: verbal (nicknames, insults, etc.), physical (hitting, kicking, etc.), and indirectly, that is, without direct physical or verbal contact with the victim [6, 7], spread rumours, damage the reputation of another student, or exclusion (e.g. leave a student out of a group intentionally, not invite him or her to a party). Nowadays, bullying through the use of cell phones and/or computers – for example, sending rude and hurtful messages with these devices – has given rise to a new type of abuse called cyberbullying or electronic bullying [8, 9].

Although cyberbullying is debated about how to be defined and measured [10] [11], most researchers agree that cyberbullying is a kind of intentional aggression and harmful behaviour that occurs with electronic medium [12], such as computers and mobile phone, resulting in a power of imbalance [13, 14].

Some authors suggest that cyberbullying is merely an extension of bullying executed through new technologies of information and

communication (NTIC) [9, 15–17]. For instance, Williams and Guerra [18] argue that technological devices only provide an additional medium through which bullying can occur. Considering this argument, one might anticipate that the core characteristics of cyberbullying are no different from bullying. In line with this, some researchers detected a significant overlap between victimization and cybervictimization, specifically among adolescent samples [19, 20]. On the other hand, other authors suggest that cyberbullying differs from bullying in some important aspects or features (e.g. anonymity, massive audience, disinhibition, among others). They suggested that – although they may share features in common – cyberbullying is, in some way, different from bullying [8, 12, 21] and, for example, it is perpetrated by somewhat different groups of adolescents [14, 22, 23]. For instance, Kubiszewski et al. [23] and Resett and Gámez-Guadix [24] detected little overlap between those who perpetrated bullying and those involved in cyberbullying. Perhaps, the little overlap between bullying and cyberbullying may be due to the fact that, although they are related phenomena, cyberbullying can occur in any time and any place (for instance, outside school), making more difficult for adults to monitor and detect it [25]. It is anonymous, and this fact increases disinhibition [11] and increases potential audience in a larger and huge manner [16].

Nowadays, cyberbullying is very frequent between adolescents, mainly in middle adolescence [26]. For instance, Tokunaga [27] detected that 20–40% of young adolescence has been victims. However, figures vary across researches [8]. In general, the prevalence rates of cybervictimization range across investigations from 10% to 35% [8, 15, 25, 28, 29]. Regarding aggressors, studies indicated that 11–44% are perpetrators of cyberbullying [30]. So, the escalation of cyberbullying has become an issue of increasing concern for teachers, parents, adolescents, and school communities [31]. However, the research on cyberbullying is still in its beginnings compared to bullying [32, 33].

## **Bullying, Cyberbullying, and Mental Health Problems**

Both being a victim of bullying and being a perpetrator are risk factors for the psychopathology of development. Those who are victims present higher levels of emotional problems: greater anxiety, depression, and worse self-esteem than non-involved groups [3, 5, 34, 35]. The aggressors, on the other hand, show higher levels of externalizing problems: antisocial behaviour, substances use, as well as greater impulsivity and attention problems, among others [36–38]. A recent meta-analysis from 18 longitudinal studies with adolescents detected the association between victimization with emotional, behavioural, and interpersonal problems, while finding the association between bullying and externalizing problems, interpersonal issues, and poor school performance [39].

Regarding cybervictimization and psychological functioning, it has been related to a variety of psychological problems, such as depression, anxiety, low self-esteem, low self-concept, and, in some cases, suicide attempts [5, 11]. Regarding cyberbullying some authors argue that cyberaggressors do not present more emotional problems, but they engage in externalizing problems. In fact, cyberbullies score better in mental health compared to non-involved adolescents [37, 40, 41]. However, some recent investigations found that being a cyberperpetrator was linked to poor psychological adjustments [42–45]. For instance, some studies detected that cyberaggressors showed more psychological difficulties and poorer quality of life [46]. In addition, Bauman, Toomey, and Walker [47] demonstrated that cyberbullying was related to suicide attempts in males, while Hinduja and Patchin [48] detected this link in both sexes. Researchers suggested that these results demonstrate a lack of understanding for the perpetrators in their own behaviour, so they possibly engaged in one act of online bullying that quickly escalated, becoming a bigger problem [45].

## **Bullying, Cyberbullying, and Intervention Programmes**

Due to the important risk factor, that is, bullying and cyberbullying, for the mental health of adolescents, a central aspect is to develop effective interventions to reduce such problems. Therefore, many school-based programmes have been devised and implemented in an attempt to reduce bullying and in recent years, to reduce cyberbullying, as well. In 1983, the first large-scale anti-bullying programme was implemented in Bergen, Norway [3, 4, 49]. This programme showed a significant decrease in victimization of about half after the programme [3, 49]. The Olweus Bullying Prevention Programme is recognized by the Center for the Study and Prevention of Violence as 1 of only 11 Blueprints Model Programmes and by the Substance Abuse and Mental Health Services Administration as a model programme in this respect. However, although Olweus programme showed a significant effect in preventing bullying in primary school children, it was less effective in adolescents. Moreover, its effectiveness was less intense in other countries, such as the United States [50, 51]. A recent meta-analysis [52] included 79 studies regarding anti-bullying programme from 2009 until 2018 suggesting similar percentage of reduction for bullying and victimization: 19–20% and 18–19%, respectively.

In recent years, another programme that demonstrated an important reduction of bullying in children and adolescents was the KiVa, an acronym for *Kiusaamista Vastaan*, “against bullying” [53, 54]. KiVa was developed and implemented in Finland and is currently being extrapolated to other countries, even Latin-American countries, such as Argentina, Perú, Colombia, and Chile, among others. KiVa programme was implemented in 8237 children and showed to be effective in reducing school bullying and victimization [54]. However, a drawback of this intervention is that it has been more effective in children and there is much less evidence of its effectiveness in other countries besides Finland.

Compared to bullying, fewer intervention programmes have been developed to reduce cyberbullying, and – even – many anti-bullying

programmes were extrapolated to cyberbullying. Many authors [55] suggested that research on effective anti-cyberbullying intervention is lacking. One could suppose that efforts aimed to reduce bullying are expected to also be effective in reducing cyberbullying because of the considerable overlap between cyberbullying and bullying [56–58]. However, other authors argue that because there is not a perfect overlap between bullying and cyberbullying, it is necessary to improve or create evidence-based cyberbullying prevention programme [55, 59]. There is a meta-analysis study [60] that evaluated programme against bullying and cyberbullying that included 17 researches, but its problems were that focus on school-aged children only included studies from the United States, Australia, and North Europe, and research was performed from 2000 until 2013. With rapid changes and development of new technologies of information and communication (NTIC), in only 5 years important changes may have occurred with respect to cyberbullying and its associated behaviours.

One of the most accurate evaluated programmes against cyberbullying is “Media Heroes” (Medienhelden), a German school-based programme that attempts to raise students’ awareness about risks associated with new technologies, to increase empathy and social responsibility, and to teach abilities to defend oneself and others from cyberbullying [61]. Two randomized investigations detected that the programme significantly reduced cyberbullying [61, 62].

About the intervention programmes for cyberbullying in Spanish populations, Cyberprogramme 2.0 [63] and ConRed [64, 65] are the best known with some evidence in the reduction of cyberbullying. However, the problem for above-mentioned programmes is that its effectiveness has not been proven in other countries.

## **This Study**

In the last years, different meta-analytic reviews analysed the effectiveness of bullying and cyberbullying intervention programmes [59, 66, 67].

Baldry and Farrington [66] studied the effectiveness of 16 anti-bullying programmes implemented in 11 different nations, and they pointed out that 8 programmes produced desirable results, 2 produced mixed results, 4 produced small or negligible effects, and 2 generated undesirable effects. Although these results were optimistic, Baldry and Farrington [66] affirmed their meta-analysis was not enough evidence to confirm the efficacy of the anti-bullying programmes, because some studies did not have strong research designs and lacked of key information.

Mishna et al. [67] evaluated three programmes on cyberbullying (two implemented in the United States and one in Canada). The programmes were the US-developed I-SAFE curriculum, the Missing Programme, and Help-Assert Yourself-Humor-Avoid-Self-Talk-Own It. In general, Mishna et al. [67] found that the programmes increased Internet safety knowledge but did not impact online behaviour. In other reviews, Van Cleemput et al. [59] examined 15 programmes, and they included 6 programmes in their meta-analysis. The remainders were excluded for different reasons: case studies, problems with study design, and no outcomes for cyberbullying behaviour, among others. Results suggested that the overall effects of cyberbullying programmes were modest, but significant, with some of them yielding greater reductions. These programmes include social skills training, use of peer educators, and information for teachers, staff, and families, among others [68]. Other recent meta-analysis [55] for school-aged children and adolescents included 15 studies that used randomized controlled trials to evaluate programmes against cyberbullying detected. That programme reduced cyberbullying perpetration by approximately 10–15% and cybervictimization by 14%. They pointed out that future investigation needs to address, to develop specific anti-bullying programmes, and to evaluate the overlapping between bullying and cyberbullying.

Although there are several meta-analyses studying the effectiveness of bullying and cyberbullying intervention programmes, no meta-analytic review jointly analyses the effectiveness of interventions on both bullying and cyberbullying

in adolescents. Several authors indicated the importance of utilizing evidence based on anti-bullying programmes to better inform cyberbullying intervention [56], such as top-down methods of cyberbullying programmes (e.g. the Barlett and Gentile Cyberbullying Model) [69]. However, effectiveness of anti-cyberbullying programmes is unclear, yet. In addition, something that is not clear is the extent to which cyberbullying interventions are so effective compared to bullying. In line with this, Gaffney et al. [55] asked themselves if school-based programmes should target bullying and cyberbullying concurrently or separately. So, the strengths of this chapter are two: (1) conduct jointly a review of scientific studies to reduce bullying, victimization, cyberbullying, and cybervictimization in adolescents and (2) include wide range of studies in Spanish, English, and Portuguese languages.

Based on this background, the objective of this meta-analysis is to analyse the effectiveness of bullying and cyberbullying interventions in adolescents aged 10–19 years, published between 2000 and July 2018 inclusive in English, Spanish, and Portuguese. We also studied whether intervention programmes have any variation in its effectiveness on perpetrator and victim of traditional bullying and cyberbullying.

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## Method

### Inclusion and Exclusion Criteria

The inclusion and exclusion criteria for this meta-analytic review were aspects of population and methodological design of the studies. Concerning the population, we selected interventions on bullying or cyberbullying for adolescents ranging between the ages of 10 and 19 for both sexes. Although adolescence begins at around 11–12 years of age for many authors [70, 71], the age of 10 was taken into consideration because many studies included it and it was very close to the beginning of adolescence. Besides, in some cases, many subjects have already gone through the puberty changes that give rise to it. We also excluded in this meta-analytic review

intervention focusing on children and adults – as, for example, teachers or parents – or intervention focusing on non-community participants (for instance, adolescents with generalized anxiety disorder). Moreover, concerning methodological design, we included interventions that discourage bullying and cyberbullying in adolescents, and that include intervention with and without control groups. The duration of the intervention and follow-up measures were not considered an inclusion criterion. We included interventions with significant and non-significant results in comparison between the treatment and the control group or between the pre- and post-test in the treatment group. We also included interventions carried out inside and outside of the school settings. Finally, we selected publications appearing between 2000 until July 2018 and only those written in English, Spanish, or Portuguese. Studies published in other languages were excluded.

## Search Strategy

We used the following databases to do the review of the literature: Dialnet, EBSCO Host, JSTOR, SciELO, ScienceDirect, NCBI, PsycINFO, and Latindex. We performed the search in July 2018, and papers published in English, Spanish, and Portuguese were included. The search keywords used for this meta-analysis were “bullying”, “cyberbullying”, “victimization”, and “harassment”; and the following terms were employed in order to comply with the intervention criteria: “intervention”, “outcome”, “programme”, and “treatment”. The search was carried out by combining each of the key terms, for example, bullying and intervention, bullying and programme, etc.

## Data Extraction

Three researchers carried out the selection of papers from the database following the inclusion criteria. The selection of studies was made

in two stages or steps. In the first step, researchers evaluated the pertinence of the study through the title and abstract of the paper. In the second, researchers evaluated the full text of the paper. Researchers agreed a final list of papers with discrepancies resolved by consensus. Finally, 17 [17] papers of bullying intervention and 11 [11] papers of cyberbullying intervention were left because they fulfilled all of the inclusion criteria, and the data needed to perform the analysis was extracted from them. The information retrieved included author and year of study, intervention (duration, location), sample characteristics (age group and mean, gender ratio), and methodological design.

## Statistical Analyses

The Comprehensive Meta-Analysis Programme (version 2) was used to calculate forest plot, funnel plot, and heterogeneity. In the case of dichotomous outcomes, odds ratio was extracted from articles, and in the case of continuous outcomes, mean and standard deviation or *t* test, *F*-statistic, and sample size were extracted from articles. Then, this statistical information was transformed (using Comprehensive Meta-Analysis Programme) to calculate standard differences of mean to allow across study comparisons. When a study had multiple measures for the same outcome, for example, physical and verbal bullying, we calculated an overall effect size averaging the individual effect sizes.

Moreover, we calculated *Q* statistic and the  $I^2$  statistic to measure statistical heterogeneity between the studies. A non-significant *Q* statistic and an  $I^2$  statistic smaller than 50 indicates absence of heterogeneity between the studies.

Finally, we used funnel plots and the fail-safe number to study the publication bias. If the fail-safe number is greater than  $5k + 10$  (*k* is the number of articles included in meta-analytic review), it is considered that it is unlikely that the number of unpublished articles with null results would change the significant find-

ings of the meta-analytic review to statistical non-significance.

## Results

Figure 32.1 shows the search and selection process of studies included in the meta-analytic review. We identified 5763 studies through databases (see Fig. 32.1). Subsequently, we selected 96 articles for a comprehensive review and finally 16 articles (which include 19 studies) were included in the final traditional bullying meta-analysis. Fourteen articles (which include 17 studies) were included in the final traditional victimization meta-analysis. Eleven articles (which include 14 studies) were included in the final cyberbullying meta-analysis. Finally, eight articles (which include nine studies) were included in the final cybervictimization meta-analysis (see Fig. 32.1).

### Meta-analytic Review of Effectiveness of Traditional Bullying and Traditional Victimization Interventions

A total of 23,394 adolescents participated in the studies of traditional bullying intervention (12,964 adolescents were included in the treatment group, the other were included in the control group) and 27,386 adolescents participated in the studies of traditional victimization interventions (13,725 adolescents were included in the treatment group).

Concerning effect sizes of traditional bullying intervention were of standard differences of mean =  $-0.25$  (95% CI =  $-0.33$ ,  $-0.17$ ,  $Z$ -value =  $-5.88$ ,  $p \leq 0.001$ ) favouring the intervention condition in the prevention of bullying using random model and standard differences of mean =  $-0.18$  using fix model (95% CI =  $-0.21$ ,  $-0.15$ ,  $Z$ -value =  $-12.59$ ,  $p \leq 0.001$ ). The forest plot results can be seen in Fig. 32.2. Heterogeneity of studies was significant ( $Q$ -value = 107.31,  $df = 18$ ,  $p < 0.001$ ,  $I^2 = 83.22\%$ ).

Besides, effect sizes of traditional victimization intervention were of standard differences of mean =  $-0.14$  (95% CI =  $-0.23$ ,  $-0.04$ ,  $Z$ -value =  $-2.78$ ,  $p \leq 0.01$ ) favouring the intervention condition in the prevention of victimization using random model and standard differences of mean =  $-0.11$  using fix model (95% CI =  $-0.14$ ,  $-0.09$ ,  $Z$ -value =  $-8.40$ ,  $p \leq 0.001$ ). The forest plot results can be seen in Fig. 32.3. Heterogeneity of studies was significant ( $Q$ -value = 163.45,  $df = 16$ ,  $p < 0.001$ ,  $I^2 = 90.2\%$ ).

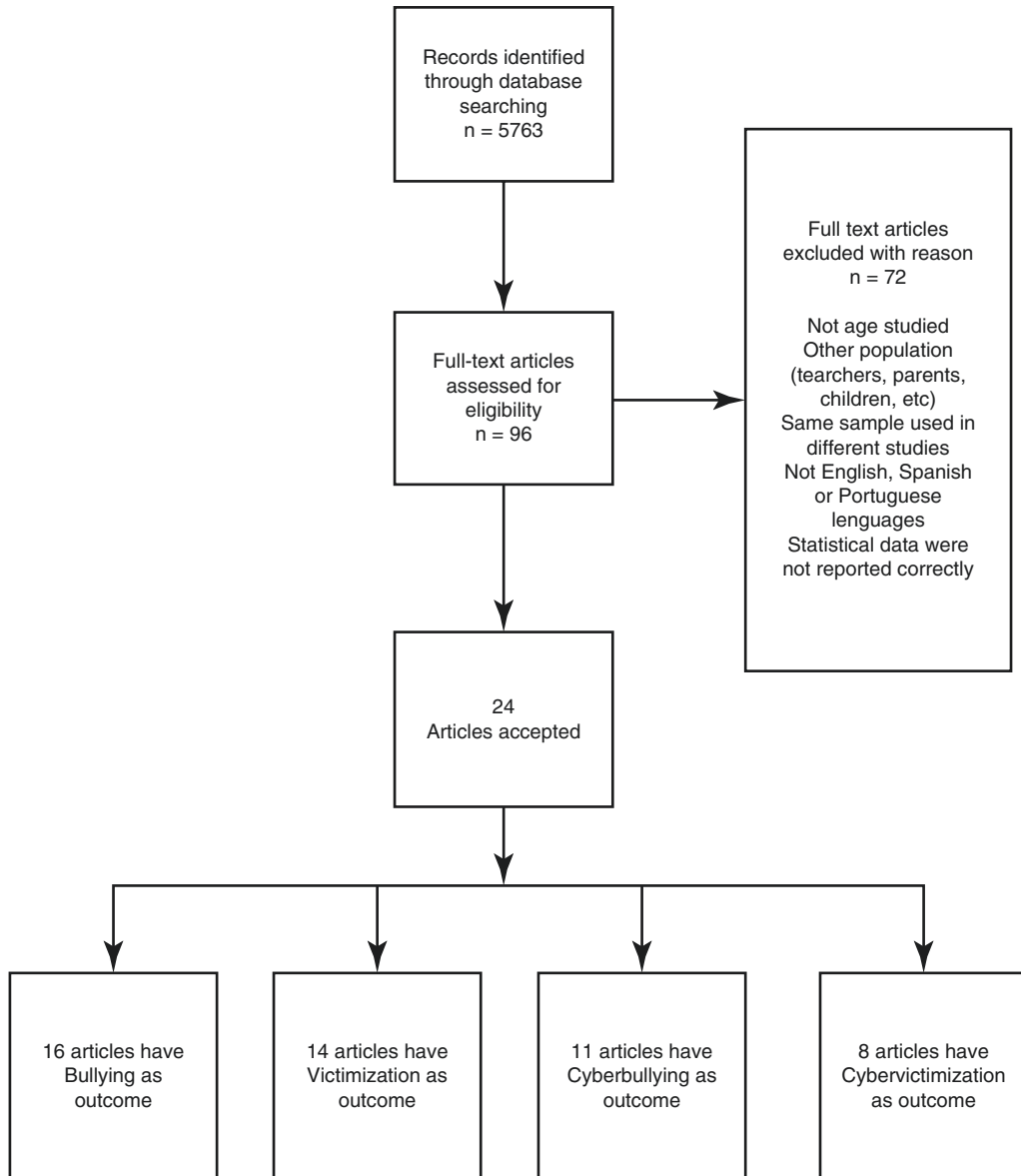
### Publication Bias

Finally, we did not detect publication bias, as the funnel plot shown was symmetrical for all analyses (see Fig. 32.4). Moreover, the potential impact of unpublished studies on the analysis was calculated with fail-safe number obtaining a value of 794. We estimated that there is no publication bias because it is unlikely that 794 articles would be found with statistical non-significance.

### Meta-analytic Review of Effectiveness of Cyberbullying and Cybervictimization Interventions

A total of 9990 adolescents participated in the studies of cyberbullying intervention (5532 adolescents were included in the treatment group, the other were included in the control group), and 7627 adolescents participated in the studies of cybervictimization interventions (4590 adolescents were included in the treatment group).

Concerning effect sizes of cyberbullying intervention were of standard differences of mean =  $-0.19$  (95% CI =  $-0.30$ ,  $-0.08$ ,  $Z$ -value =  $-3.31$ ,  $p \leq 0.001$ ) favouring the intervention condition in the prevention of cyberbullying using random model and standard differences of mean =  $-0.11$  using fixed model (95% CI =  $-0.15$ ,  $-0.07$ ,  $Z$ -value =  $-5.32$ ,  $p \leq 0.001$ ). The forest plot results can be seen in Fig. 32.5. Heterogeneity of studies was signifi-



**Fig. 32.1** Flowchart of the screening process of 24 articles identified during systematic searches of 5763 search results

cant ( $Q$ -value = 77.55,  $df = 13$ ,  $p < 0.001$ ,  $I^2 = 83.23\%$ ).

Moreover, effect sizes of cybervictimization intervention were of standard differences of mean =  $-0.13$  (95% CI =  $-0.23$ ,  $-0.04$ ,  $Z$ -value =  $-2.68$ ,  $p \leq 0.01$ ) favouring the intervention condition in the prevention of cybervictimization using random model and standard differences of mean =  $-0.08$  using fix model (95% CI =  $-0.12$ ,  $-0.03$ ,  $Z$ -value =  $-3.43$ ,  $p \leq 0.001$ ). The forest plot results can be seen in

Fig. 32.6. Heterogeneity of studies was significant ( $Q$ -value = 29.85,  $df = 8$ ,  $p \leq 0.001$ ,  $I^2 = 73.2\%$ ).

### Publication Bias

Finally, the funnel plot does not show a symmetrical distribution for all analyses (see Fig. 32.7). However, the potential impact of unpublished studies on the analysis was calculated with fail-

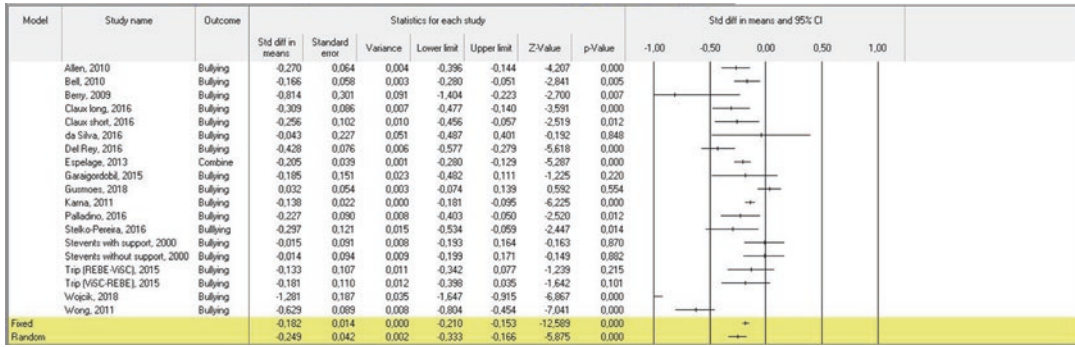


Fig. 32.2 Effect sizes for prevention of traditional bullying

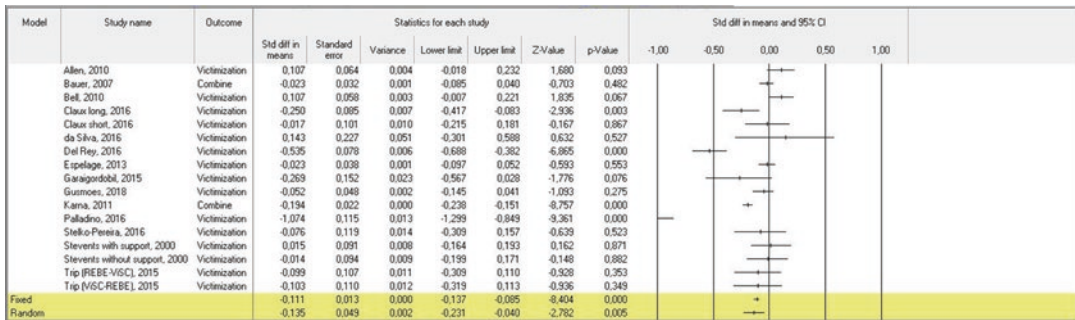


Fig. 32.3 Effect sizes for prevention of traditional victimization

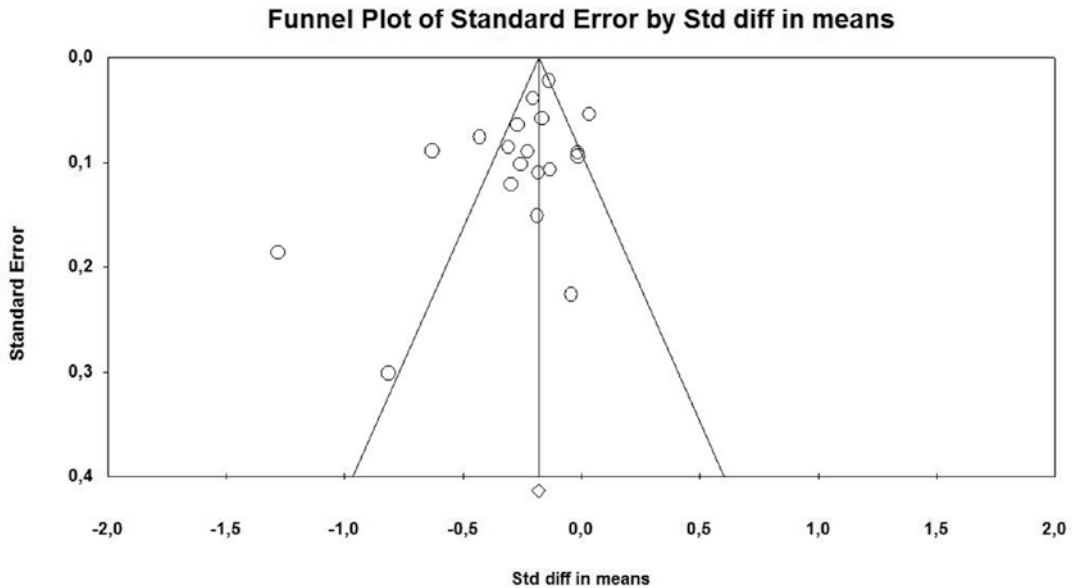


Fig. 32.4 Funnel plot of articles of traditional bullying intervention and traditional victimization intervention



Model	Study name	Outcome	Statistics for each study							Std diff in means and 95% CI				
			Std diff in means	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value	-1,00	-0,50	0,00	0,50	1,00
	Claux, 2016 (Long intervention)	Cyberbullying	-0,263	0,086	0,007	-0,431	-0,095	-3,073	0,002					
	Claux, 2016 (Short intervention)	Cyberbullying	-0,141	0,102	0,010	-0,340	0,058	-1,285	0,166					
	Cross, 2015	Cyberbullying	0,000	0,035	0,001	-0,069	0,069	0,000	1,000					
	Del Rey, 2016	Cyberbullying	-0,094	0,127	0,016	-0,343	0,155	-0,738	0,460					
	Desmet, 2018	Cyberbullying	-0,007	0,068	0,005	-0,141	0,126	-0,110	0,912					
	Garagardabai, 2015	Cyberbullying	-0,562	0,154	0,024	-0,864	-0,260	-3,652	0,000					
	Grandier, 2016	Cyberbullying	-0,183	0,045	0,002	-0,271	-0,095	-4,080	0,000					
	Martinez-Vichis, 2018	Cyberbullying	-0,261	0,153	0,024	-0,561	0,040	-1,701	0,089					
	Palladino, 2016	Cyberbullying	-0,524	0,112	0,013	-0,745	-0,304	-4,550	0,000					
	Schulze-Kumbholz, 2016 (Short intervention)	Cyberbullying	0,010	0,101	0,010	-0,188	0,208	0,095	0,924					
	Schulze-Kumbholz, 2016 (Long intervention)	Cyberbullying	0,089	0,085	0,007	-0,078	0,256	1,042	0,297					
	Tanrikulu, 2015	Cyberbullying	-3,375	0,647	0,418	-4,643	-2,107	-5,217	0,000					
	Walker, 2013 (Long intervention)	Cyberbullying	-0,296	0,093	0,009	-0,478	-0,114	-3,186	0,001					
	Walker, 2013 (Short intervention)	Cyberbullying	-0,108	0,114	0,013	-0,331	0,116	-0,944	0,345					
Fixed			-0,108	0,030	0,000	-0,148	0,068	-5,222	0,000					
Random			-0,108	0,057	0,003	-0,300	-0,077	-3,307	0,001					

Fig. 32.5 Effect sizes for prevention of cyberbullying

Model	Study name	Outcome	Statistics for each study							Std diff in means and 95% CI				
			Std diff in means	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value	-1,00	-0,50	0,00	0,50	1,00
	Claux, 2016 (Long intervention)	Cybervictimization	-0,143	0,085	0,007	-0,309	0,024	-1,680	0,093					
	Claux, 2016 (Short intervention)	Cybervictimization	0,031	0,102	0,010	-0,169	0,231	0,304	0,761					
	Cross, 2015	Cybervictimization	-0,031	0,037	0,001	-0,104	0,042	-0,839	0,401					
	Del Rey, 2016	Cybervictimization	0,000	0,079	0,006	-0,155	0,156	0,003	0,998					
	Desmet, 2018	Cybervictimization	0,000	0,068	0,005	-0,133	0,134	0,003	0,996					
	Garagardabai, 2015	Cybervictimization	-0,537	0,154	0,024	-0,839	-0,236	-3,436	0,000					
	Grandier, 2016	Cybervictimization	-0,078	0,045	0,002	-0,166	0,010	-1,745	0,081					
	Martinez-Vichis, 2018	Cybervictimization	-0,446	0,158	0,025	-0,756	-0,136	-2,823	0,005					
	Palladino, 2016	Cybervictimization	-0,431	0,112	0,013	-0,651	-0,211	-3,845	0,000					
Fixed			-0,077	0,022	0,001	-0,121	-0,033	-3,433	0,001					
Random			-0,133	0,050	0,002	-0,230	-0,036	-2,693	0,007					

Fig. 32.6 Effect sizes for prevention of cybervictimization

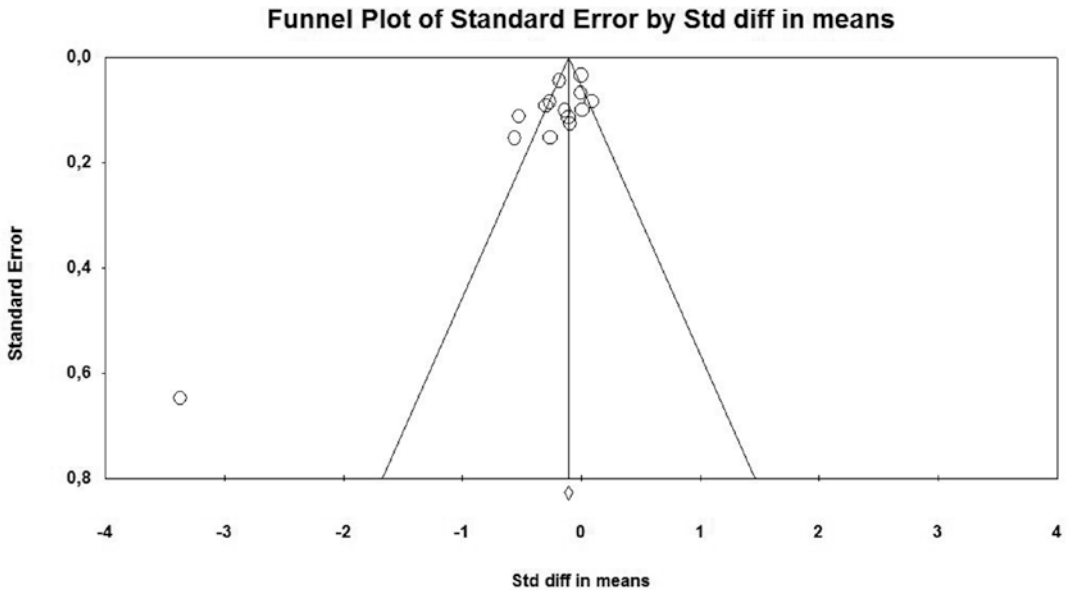


Fig. 32.7 Funnel plot of articles of cyberbullying intervention

safe number obtaining a value of 185. We estimated that there is no publication bias because it is unlikely that 185 articles would be found with statistical non-significance.

## Conclusions

Bullying and cyberbullying are important risk factors for mental health of both perpetrator and victims. For example, in extreme cases the victims of both types of aggression can commit suicide or perpetrate school massacres. On the other hand, bullying is an ethical problem that violates human rights, especially the rights of the child and adolescent [72]. Consequently, it was crucial to analyse the effectiveness of intervention programmes to reduce bullying and cyberbullying especially in adolescence, because it is common for these types of aggression to increase during this stage of life. Moreover, it was also essential to analyse the effectiveness of intervention programmes focusing on adolescence because previous studies have shown that some well-known intervention programmes as Olweus programme [50, 51] and KiVa [54] were less effective in adolescence than in childhood.

Although there are meta-analytical reviews on interventions to reduce bullying [52, 60, 73, 74] and cyberbullying [55, 59] in children and adolescence, the advantage of this study is that it evaluated together the effectiveness of interventions to reduce bullying, victimization, cyberbullying, and cybervictimization, and it also included scientific works on three different languages: English, Portuguese, and Spanish. After our review, 17 [17] papers of bullying intervention and 11 [11] papers of cyberbullying intervention between the years 2000 and 2018 were selected. Thus, a sample of 23,394 adolescents was constituted in the studies of traditional bullying, and 27,386 adolescents participated in the studies of traditional victimization.

Concerning bullying, results indicated that there was a significant effect of  $-0.24$  favouring intervention condition (with a significant heterogeneity of 83.22), whereas for victimization effect was  $-0.14$  favouring intervention condi-

tion (with a significant heterogeneity of 90.2). Regarding fixed model, effects were  $-0.18$  and  $-0.11$ , respectively. In the case of cyberbullying and cybervictimization, effects were  $-0.19$  (with a significant heterogeneity of 83.23) and  $-0.13$  (with a significant heterogeneity of 73.2), respectively. For fixed model, effects were  $-0.11$  and  $-0.08$ . These findings are in line with other meta-analyses regarding bullying [74] and cyberbullying [59], which also detected a significant reduction, although modest, of these problems.

As noted, for both bullying and cyberbullying, interventions were more effective to prevent the aggression of the perpetrator than reducing victimized, as was detected in other studies [74]. On the other hand, other meta-analyses found that anti-cyberbullying programmes were more effective in reducing cybervictimization compared to cyberbullying perpetration [55]. Comparing bullying and cyberbullying, the results of the present study indicated that bullying programmes were a bit more effective than cyberbullying programmes, while in victimization and cybervictimization the effect size of the intervention programme was similar.

No publication biases were detected for bullying, victimization, cyberbullying, and cybervictimization. That interventions were less effective for cyberbullying, compared to bullying, may be due to the fact that many interventions for this problem use a non-whole school approach since many of them try to extrapolate interventions aimed at bullying to a phenomenon with different characteristics, such as anonymity, viralization, disinhibition, and that extends beyond the school. Unlike the vast research on bullying, it is well established that there is no consensus on how to prevent cyberbullying [75], as well as there is not a consensus on how to define and measure it [11, 47]. It is also possible that due to the fact that cyberbullying is a phenomenon that extends beyond the school – through the use of new technologies – this adds a complexity, even to the whole school approach.

This study has several limitations that must be mentioned. One of them is the high level of heterogeneity found among studies. The high het-

erogeneity found may be due to different reasons:

1. The operationalization of the constructs, for instance, using different measurement – mainly in the case of cyberbullying. Another problem is that in all cases bullying, victimization, cyberbullying, and cybervictimization were evaluated with self-report measures. Its limitations are well known: social desirability, bias, lack of honest answers, etc.
2. Heterogeneity of the samples. Countries of different cultural traditions, such as Canada, the United States, Finland, Brazil, or Spain, among others. It generates in each of the regions different challenges to an already complex phenomenon [76]. For example, it is known that many successful interventions in the Nordic countries, for instance, Olweus anti-bullying programme, have less cultural and ethnic heterogeneity compared to other nations like the United States.
3. Samples ages that range from 10 years to 18 years old.
4. Different interventions carry out: curriculum intervention, school whole approach, social, and behavioural skill training, among others, which some are known to vary in their degree of effectiveness.

However, it must be noted that previous research indicated that  $Q$  statistic and  $I^2$  have a poor power to detect real heterogeneity when the meta-analytic review includes few studies [77].

Another limitation is that some articles were excluded because they used other languages, such as German or French. In the same way, another drawback is that there are few studies regarding cyberbullying [11] compared to bullying [17] included in the present research. However, that is not only a limitation of our meta-analysis but of the cyberbullying literature, as well. That was pointed out by Gaffney et al. [55], as well. Research on cyberbullying is still new, as we suggested. Another limitation of the present meta-analysis is the exclusion of non-school participants and samples other than ado-

lescents. For example, cyberbullying is quite prevalent in college students [78]. Despite these limitations, this work provides an important contribution to demonstrating that interventions for bullying and cyberbullying in adolescence reduce this problem in a significant way, although its effects are small.

Future studies should examine why interventions are a bit less effective for cyberbullying, on one hand, and develop and test effectiveness of specific programme for the prevention of bullying, on the other. It is hoped that these findings will encourage further interest in bullying and cyberbullying prevention researches. Future work should examine the effectiveness of interventions to reduce bullying and cyberbullying but aimed at teachers and parents of students, on one hand, and evaluate effectiveness of anti-bullying programmes with another measure besides self-reports, such as peer nominations. Future meta-analysis should address what components of the interventions may explain variability in intervention outcomes and what components are more effective for the reduction of bullying and cyberbullying or both. Finally, it would also be desirable to generate local interventions for bullying and cyberbullying in each country. It must be considered that both bullying and cyberbullying are complex constructs that acquire cultural features in each of the regions, as it was detected in the case of bullying in a study with 14 nations and 13 languages [79]. That is, bullying can manifest in different ways in each culture. For instance, in Japan bullying is carried in a relational way, whereas in England it is carried out in a physical way [80].

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