

**School-based anti-bullying interventions for adolescents in low- and middle-income countries: A systematic review**

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**Abstract** Bullying is an international phenomenon that is increasingly becoming recognized as a public health issue and mental health concern. Systematic reviews suggest that complex, whole-school anti-bullying interventions are effective at reducing victimization and bullying in high-income countries (HICs). We report a systematic review evaluating the effectiveness of school-based interventions to reduce and prevent bullying among adolescents in low- and middle-income countries (LMICs). In addition to searching 31 databases, we also hand searched key journals and grey literature. We contacted experts in the field for input during the search process. After rigorously screening retrieved studies against predetermined inclusion/exclusion criteria, only three studies were included in this review. One study used a cognitive and behavioral approach to target bullying among adolescents in Romania, one study adapted the international Olweus Bullying Prevention Program (OBPP) for use in Malaysia, and the other developed a model for use in South Africa. Results from all three studies were mixed and provided no overall evidence of effect for the interventions. The validity of the results for two of the studies was unclear due to substantial or unclear risks of bias. Given the well-established evidence base for anti-bullying interventions in HICs, there is an urgent need for more rigorously

evaluated and reported studies in LMICs, adapted for contexts of considerable resource constraints.

**Keywords** Bullying; Systematic review; Low and middle income countries; Cultural adaptation

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## **1. Introduction**

As part of the Sustainable Development Goals of 2015, world leaders made a commitment to end all forms of violence against children by 2030. Bullying in schools, falls within this remit and is increasingly being recognized as an urgent public health priority (Srabstein, 2010). Bullying is defined as repeated acts of intentional aggression targeting individuals who are less able to defend themselves due to an imbalance of power (Olweus, 1994). Acts of bullying include being called nasty names, being rejected, ostracized or excluded from activities, having rumours spread about you, having belongings taken away, as well as teasing and threatening (Baldry & Farrington, 1999). -

Bullying is associated with substantial psychiatric morbidity (Copeland, Wolke, Angold, & Costello, 2013). The incidence and prevalence of the most common mental health disorders including depression and anxiety increase rapidly during adolescence (Jaffee et al., 2002). Adolescents are particularly influenced by peers, using them as primary sources for social comparison and appraisal (Prinstein & Aikins, 2004), and as such the impact of bullying on mental health may be particularly harmful during this period (Bowes, Joinson, Wolke, & Lewis, 2015). Indeed, population studies in high-income settings suggest that 25-40% of mental health problems including depression, anxiety and self-harm in young adults may be attributable to bullying in the early adolescent years (Bowes et al., 2015; Fisher et al., 2012; Stapinski et al., 2014). In addition to mental health outcomes, bullying may also lead to school refusal and absenteeism (Kearney, 2008), which may seriously affect educational attainment, and can in turn lead to poorer employment prospects and lower earnings when in employment (Wolke, Copeland, Angold, & Costello, 2013). Bullying perpetration

also has negative impacts and is linked to later antisocial and violent behaviour and illegal drug use (Ttofi, Farrington, Losel, Crago, & Theodorakis, 2016; Ttofi, Farrington, Losel, & Loeber, 2011). Effective action to reduce bullying during adolescence could have profound implications for population health given the well documented associations between bullying and poor social, economic and health both in adolescence and later life (Arseneault, 2017; Ttofi, Farrington & Losel., 2011; Wolke et al., 2013).

Research on bullying predominantly originates from high-income settings, yet data on bullying prevalence across 85 low and middle-income countries from the Global School-Based Student health Surveys found that an average of 29.2% of 13-15 years olds reported being bullied on one or more days during the past 30 days (United Nations Special Representative of the Secretary-General on Violence Against Children, 2016). Low- and Middle-Income Countries (LMICs) are classified as economies or countries that fall under the Gross National Income (GNI) index. Whilst research on bullying in LMICs is limited, studies have reported increased risk of poor mental health, risk-taking behaviors and earlier school drop out in such settings (Fleming & Jacobsen, 2010). There is an urgent need to identify and evaluate evidence-based programs for reducing bullying in low and middle-income settings.

### **1.1 The role of school-based interventions**

Schools play a central role in young peoples' lives that go far beyond education. For example, schools can help shape adolescents' social, emotional and behavioral development. Educational engagement and academic attainment are closely connected with behavioral risk factors such as bullying (Fonagy, Twemlow, Vernberg, Sacco, &

Little, 2005; Li, Doyle Lynch, Kalvin, Liu, & Lerner, 2011). School enrolment and retention has increased progressively in most countries, and thus anti-bullying programs implemented in secondary schools now present an opportunity to reach the majority of adolescents.

Systematic reviews suggest that complex, whole-school interventions are effective at reducing victimization and bullying in high-income settings (Bonell et al., 2013; Ttofi & Farrington, 2011; Vreeman & Carroll, 2007). Whole-school multi-method approaches include combinations of school-wide rules and sanctions, teacher training, classroom rules, conflict resolution training and individual counseling (Vreeman & Carroll, 2007). Whole-school approaches have been shown to be most successful at reducing bullying compared to interventions targeting only one level of the problem e.g., Compared to interventions targeting only classroom-level rules against bullying, or individual-level training such as social skills groups (Vreeman & Carroll, 2007). Whole-school interventions take a socio-ecological approach to bullying by involving bullies, victims, peers, teachers, other school staff, parents and by making substantial changes to the wider school environment. A review by Ttofi and colleagues (Ttofi & Farrington, 2011) evaluated 44 school-based programs and found an average decrease of 20-23% in perpetration and 17-20% reduction in victimization. Core components of anti-bullying program were identified in order to determine whether specific components were more effective than others. Higher intensity programs and programs that included parent meetings, firm disciplinary methods, and improved playground supervision were found to be more effective. Of note, work with peers was found to be associated with an *increase* in victimization, highlighting the potential of anti-bullying interventions to cause harm. Of particular relevance to this

review, anti-bullying programs were found to work better with older children (11-years plus), with a dose response effect observed showing that program effectiveness increased with child age.

## **1.2 Impetus for the current review**

Research on the effectiveness of interventions in reducing bullying in LMICs is limited. Differences in sociocultural factors and education systems limit the generalizability of anti-bullying interventions in high-income countries to LMICs. Thus, it is important to identify effective interventions implemented in these settings. Of the existing systematic reviews that have specifically focused on the effects of school-based programs designed to reduce bullying and that have included adolescent samples, one included research in ‘developed countries’ only (Maria M Ttofi & Farrington, 2011), one review focused only on program elements on the effectiveness of intervention, not the relative impact on bullying (Salgado, Senra, & Lourenço, 2014) and none were designed to specifically identify research in LMICs (Evans, Fraser, & Cotter, 2014; Lee, Kim, & Kim, 2015; Salgado et al., 2014; Ttofi & Farrington, 2011; Vreeman & Carroll, 2007). Given the increasing focus on bullying across the world, a systematic review of bullying interventions in LMICs is timely.

## **1.3 Objectives of this review**

We aimed to address an important gap in the literature by conducting the first systematic review to specifically evaluate the effectiveness of school-based interventions or programs to reduce or prevent bullying among adolescents in LMICs. We cover a 29-year period of intervention research (from 1987-2016), and consider the implications of evidence for anti-bullying interventions on policy and practice.

## **2 Method**

### **2.1 Search strategy**

To identify studies meeting selection criteria for this review, we first conducted searches of the following 31 online databases between January 1987 (when the first credible bullying prevention programs were developed), and 30<sup>th</sup> June 2016 (for a full list, see Appendix 1). Second, manual reviews of issues from 3 relevant journals (Journal of Interpersonal Violence, Journal of School Health and Journal of School Violence) published between January 1990 and August 2016 were also conducted to identify work in this area that may not have been catalogued in searchable databases, or identified via our search. Third, to identify unpublished evaluation reports, emails were sent to relevant organizations, including PREVNet, and the Friends of Bullying Research Network (BRNET) at the University of Nebraska, and experts in the field. Fourth, for each article or report identified, we scanned the reference list to identify and retrieve additional reports that might meet inclusion criteria.

### **2.2 Search Terms**

A comprehensive search was conducted in each database using appropriate wild cards and truncations to render accurate search results. Search terms included related to country classification, study method, school type, participant age, bullying, and LMICs listed by name.

### **2.3 Inclusion criteria**

Studies were eligible for inclusion if they reported on a school-based program that



included adolescents aged 10-19 years and were aimed at targeting or preventing bullying perpetration and/or victimization among adolescents in an LMIC. Only studies published between 1987 and July 2016 were included. We used the classification of LMICs at the time of the search. In July 2016, low-income economies were defined as those with a GNI per capita, calculated using the [World Bank Atlas method](#), of \$1,025 or less in 2015; lower middle-income economies were those with a GNI per capita between \$1,026 and \$4,035; upper middle-income economies were those with a GNI per capita between \$4,036 and \$12,475; high-income economies were those with a GNI per capita of \$12,476 or more.

We only included studies that evaluated at least one outcome measure on bullying. Our review specifically focused on bullying and not other forms of aggressive behavior or school violence more broadly. We defined school bullying as set forth by Olweus to be an: “act of aggression, intimidation or coercion from one or a group of individuals (often termed as bullies) towards or against individual/s (often termed as bullied or victims) who is/are weaker than them in terms of physical size, psychological/social power or other factors which result due to power imbalance” (Olweus, 1994). In adhering to this definition, we recognize that other programs designed to reduce school aggression or other problem behaviors might affect school bullying outcomes; however, it was not our intention to identify those interventions that had bullying as peripheral outcomes. We aimed to include outcomes measured by independent observers, self-reported measures, peer ratings or teacher-reports.

## **2.4 Exclusion criteria**

Since our research question centers around causal claims of intervention affecting outcome, we only included studies that evaluated an anti-bullying intervention

condition to a no-treatment or waitlist control group (i.e. experimental and quasi-experimental designs).

Studies with no control/comparison group and qualitative studies were excluded from this review. We also excluded studies that focused solely on cyberbullying as this was seen as a separate albeit related issue that would be heavily influenced by differing school-level policies regarding mobile phones and internet usage (Smith, Kwak, & Toda, 2016). Studies where prevention or reduction of bullying was not addressed or stated in study aims/objectives or in outcome measures, were excluded from the review. Studies from HICs were excluded.

Full copies of studies that appeared to meet our inclusion criteria were assessed by two study authors (LB and BS) using a data extraction form. Where data were not available in published reports, study authors were contacted to supply missing information.

## **2.5 Assessing Risk of Bias**

Critical appraisal of the studies, based on the Cochrane Risk of Bias Tool (Higgins and Green, 2008), assessed whether there was an adequate method of sequence generation, allocation concealment, blinding of assessors, satisfactory treatment of attrition including ‘intention to treat’ analysis, and assessment of potential confounders. We also assessed the reliability and validity of outcome measurement and associated risk of bias relative to the informant. Due to the small number of studies identified, meta-analysis was not possible.

### **3 Results**

Our extensive searches identified 2210 studies from the published and unpublished literature, with an additional study identified during the review process (see Figure 1). In total, 84 studies were retained for abstract screening (including studies with unclear titles), and 7 studies underwent a full text review (including studies with unclear abstracts), of which 4 did not meet inclusion criteria and were excluded from our review (see below and Table 1). In total, 3 studies met the inclusion criteria specified for our review: Trip, Bora, Sipos-Gug et al (2015), Meyer and Lesch (2000), and Yaakub et al., (2010). Table 1 provides a list of studies excluded based on abstract screening, and Table 2 provides a list of studies excluded after full text review.

#### **3.1 Excluded studies**

We excluded four studies after full-text review. Given the dearth of evidence in this field, it is useful to discuss these excluded studies in more depth than might be typical in systematic reviews so as to better understand the existing landscape of evidence on anti-bullying school-based interventions in LIMCs.

One study conducted in Iran met all of our inclusion criteria except that it is included primary (elementary) school children only (Azad and Amiri, 2012). The study was conducted in Iran, and evaluated the effectiveness of the Olweus Bullying Prevention Program (OBPP) on the rate of bullying behaviors among 40 primary school boys, randomized to intervention or control conditions. The experimental group was reported to have significantly lower bullying and victim behaviors at post-test and 6-month follow up ( $p < 0.0001$ ). Whilst this study appears to be well-conducted and provides some evidence of the transferability of the OBPP, it does not inform on the

use of anti-bullying interventions for adolescents, and thus was not included in our review.

An additional two studies described interventions with an anti-bullying component, but neither study measured bullying as an outcome variable (Stelko-Pereira and Williams, 2016 and Dorostkar, 2016). Stelko-Pereira and Williams (2016) report on a Brazilian teacher-training program designed to reduce school violence (“Violência Nota Zero”) and evaluated using a randomized waitlist controlled design. Although one of the program’s aims was to reduce bullying, the program does not explicitly measure bullying and thus was excluded from our review. Dorostkar (2016) evaluated an adaptation of the OBPP in Isfahan, Iran. Thirty male high-school students, identified as bullies, were randomly assigned to experimental and control conditions. The quasi-experimental design used a pre-test, post-test and six-month follow-up to evaluate findings. Dorostkar presents no data on pre- or post-test measurement, simply stating that “results showed some indication of effectiveness of the bully-intervention program in one of the schools”. Though this study evaluates an intervention based on the OBPP, it aimed to reduce Oppositional Defiance Disorder and Conduct Disorder, and did not measure bullying perpetration as an outcome. Thus this study was excluded from our review.

Finally, Obrdalj et al., (2014) reported on an anti-bullying prevention program for adolescents in Mostar, Bosnia and Herzegovina. Delivered to large groups of students, the program involved an interactive lesson on bullying and its consequences. This study did not include a control group for comparison, thus failing to meet our study design inclusion criteria.

### 3.2 Included studies

We included three studies in our review, all of which evaluated anti-bullying programs against treatment-as-usual group(s) (see Table 3 for an overview). The studies were from upper-middle income countries: Romania, Malaysia and South Africa.

**Trip, Bora, Sipos-Gug et al (2015)** conducted a randomized three-arm study with a total of 970 sixth-grade students (mean age 11.8 years) from 11 schools in Oradea, Romania. The program consisted of a cognitive-behavioral component (Rational Emotive Behavioral Education, REBE) that aimed to enhance student's social and emotional learning, and a behavioral component (Viennese Social Competence; ViSC) that was specifically designed to address bullying. The REBE program was based on rational emotive behavioral theory and contained 9 student lessons. The ViSC program was based on social learning theory and comprised 10 student lessons. The programs were combined, with the order of programs experimentally manipulated. The control group was a treatment as usual condition and contained three schools (315 participants in total), the 'REBE-ViSC' experimental group contained 5 schools (14 classes, 385 students in total), and the 'ViSC-REBE' contained three schools (11 classes, 270 participants in total). External trainers delivered the programs during school classes over the course of one school year. Trainers received a total of 12-hours training on the two programs, and had weekly supervision meetings. Whilst the study reports that schools were randomized to each of the three conditions, no information is given regarding the method of randomization.

Outcomes were student self-reported bullying perpetration and victimization, assessed

at pre-test (October), mid-point (March) and post-test (June) and consisting of one global item and three specific items covering different forms of bullying. Cronbach's alpha co-efficients were between 0.80-0.90). Two subscales of the Anger Regulation and Expression Scale (ARES, DiGiuseppe and Tafrate, 2011) were also used to assess internalizing anger and overt anger. Finally, two subscales of the Scale of Low Frustration Tolerance (LFT) for Students (Trip and Bora, 2011) were used to measure teacher-reported LFT learning and LFT entitlement. All scales had high Cronbach's alpha co-efficients. No information was provided regarding validation of the scales for use in Romania.

Multilevel growth modeling was used to test the program's efficacy and account for the clustering of data (i.e. student data within classes and within schools), with adjustment for participant sex. Sensitivity analyses discarding data from students participating in only one measurement (N= 224) revealed a negligible impact of missing data on the results. Full information maximum likelihood estimation under the missing at random assumption was used to address missing data in the final analyses. No significant differences in bullying perpetration or victimization in the control versus treatment groups were identified at follow-up, with small unstandardized coefficients ranging from -0.068 to 0.009,  $p > 0.05$ . The REBE-ViSC condition was more effective in changing negative emotions (specifically overt anger) than the ViSC-REBE condition (Cohen's  $d = 0.31$ ), and both experimental conditions were effective in reducing dysfunctional cognitions Cohen's  $d$  ranging from 0.31-0.64). It was noted by study authors that in a different trial of the ViSC program (. (Atria and Spiel, 2007), lessons were delivered by trained teachers, with large reductions in bullying perpetration and victimization reported. The use of external trainers as used in the Trip, Bora, Sipos-Gug et al (2015) may therefore have reduced

the efficacy of the program.

**Meyer and Lesch (2000)** conducted a randomized study of 54 male participants from three schools using a pairwise matched design at the individual level. The mean age of the participants were not reported, though the needs assessment was conducted with 12-15 year old boys. Participants were matched according to the level of bullying based on a Peer Report measure established by Meyer (1996). Within each school, 18 ‘bullying boys’ were randomly assigned to one of the three experimental conditions, though no information is provided regarding the method of randomization. The three experimental conditions were intervention group (18 boys), controlled group with supervision (18 boys) and control group (18 boys) without supervision. The intervention was based on Patterson’s (1986) Social Interactional Model to address aggressive behavior, and included components such as the reinforcement of positive behavior, self-observation, homework tasks and role-plays. Incentives like game tokens, chocolates and cinema tickets were rewarded for non-bullying behavior. These incentives were considered key to promoting behavior change in the intervention. The program consisted of 17 sessions implemented for 10 non-consecutive weeks. Each session was 20-hours long, with sessions held twice weekly at the schools, during school hours. Participants were monitored weekly through self-report and ‘buddy’ monitoring. The program was evaluated through video feedback, direct observation, feedback forms and a personal journal.

Outcomes were measured using two instruments. A peer-report (Meyer, 1996) was used at pre-test to identify bullies and types of bullying. A self-report (Meyer, 1996) was completed pre- and post-intervention and at follow- up to understand where and how often participants experienced or exhibited bullying behaviors. Cronbach alpha

co-efficients for these scales were not reported. Rates of attrition in the study were unclear, and no information was given regarding handling missing data. T-tests were used to examine whether mean bullying scores changed from pre-test to post-test separately for each of the three conditions (control with supervision, control without supervision and treatment). Results were analyzed separately for each school. No significant differences were observed at the school-level using either self- or peer-reports of bullying (Self reports: school 1: Treatment  $t(5) = -1.21$ ,  $p=0.25$ , school 2: Treatment  $t(5) = 1.21$ ,  $p=0.26$  and school 3: Treatment  $t(5) = -1.21$ ,  $p= 0.92$ ; Peer-reports: school 1: Treatment  $t(5) = -1.59$ ,  $p=0.57$ , school 2: Treatment  $t(5) = -0.71$ ,  $p= 0.71$  and school 3: Treatment  $t(5) = 0.7$ ,  $p= 0.7$ ). Tests directly comparing intervention and control groups were not conducted, however the review authors calculated effect sizes based on the available data, summarized in Table 2.

**Yaakub et al. (2010)** conducted a pre-test/post-test quasi-experimental study aiming to assess the efficacy of the Olweus Bullying Prevention Program (OBPP) in reducing bullying using data from 3816 participants from six schools (three experimental and three control schools, each of which included one ‘all girls’, one ‘all boys’ and one ‘co-education’ school) in the Federal territory of Kuala Lumpur, Malaysia. The mean age of the participants was not reported. The program used a bullying survey which identified three dimensions of bullying perpetration: physical, verbal and relational and five areas of victimization: physical, verbal, relational, signal and extortion. The experimental schools received the intervention while the control schools did not receive any intervention (operating ‘business as usual’).

A 12-step program was designed and implemented by the researchers at the school-level as the first part of the intervention. The intervention included the formation of an



anti-bullying committee and collaboration with parents and school counselors. The second part of the intervention only looked at the Form 2 classes where additional activities were carried out at the classroom level. The reasons for additional classroom intervention only for Form 2 classes was not justified in the study. The results of the initial survey were presented and a post-intervention survey was carried out in both the experimental and control schools. After one year, at the school level, only the 'all girls' experimental school showed an effective reduction in the overall bullying and victimization. At the classroom level, both the 'all girls' and 'all boys' schools showed more positive outcomes in the reduction of bullying and victimization than the 'co-education' school. Analysis on control schools at both school and classroom level did not show decreases in either bullying behavior or victimization of bullying (p.598). Note that no statistical analyses were presented in the study, so effect sizes cannot be reported.

The study appears to have used an experimental design with no random allocation in the form of clusters at the school and classroom level. The study does not provide information on the sample size from each of these schools. According to the literature, the OBPP follows a whole-school approach that targets the school-level, classroom-level and individual-level (Olweus, 2001). However, this study only intervenes at the school level and at the Form 2 (ages 14-15 years) classrooms. School-level program components in OBPP comprise assessment of bullying prevalence, formation of an anti-bullying committee and encouragement of adult supervision outside classrooms. Classroom-level program components include defining and enforcing rules, discussions and activities that reinforce positive behavior and social norms. The OBPP also encourages active parental involvement. Components such as adult supervision and classroom behavior management were not mentioned in the Yaakub

et al (2010) study. Justification of program modification was not provided. Moreover, there was no information about the program adaptability in the linguistic and cultural contexts of the schools and maintenance of program fidelity to understand program effectiveness. Baseline characteristics of included schools was unclear. Rates of attrition were also unclear. The study failed to present any statistical analyses. Lastly, information on study limitations or future recommendations for implementing Olweus programs in other Malaysian schools was not provided.

### **3.3 Risk of Bias of Included Studies**

The body of evidence in this review comes from just three studies, involving a total of 4840 participants from 20 schools in 3 upper middle-income countries. Only the **Trip, Bora, Sipos-Gug et al (2015)** study adequately corrected for clustering at the classroom and school-level. No study reported a power calculation, thus it was impossible to determine if the included studies were adequately powered. In all studies there was poor reporting with respect to methods of sequence generation and allocation concealment. All studies relied on self-reported outcomes (though it should be noted that this is the norm for anti-bullying interventions internationally). Only the Trip, Bora, Sipos-Gug et al (2015) study provided reliability statistics for outcome measures used. Furthermore, only the Trip, Bora, Sipos-Gug et al (2015) study reported on attrition rates, and the method used for handling missing data. In summary, the overall risk of bias for the Trip, Bora, Sipos-Gug et al (2015) study was low. The risk of bias for the Meyer and Lesch (2000) and the Yaakub et al (2010) studies however was high, strongly limiting the reliability and validity of the results from these studies.

## **4 Discussion**

Only three studies met our inclusion criteria, highlighting the critical lack of evaluation research on anti-bullying interventions for adolescents in LMICs. Two of the three included studies were judged as being at unclear to high overall risk of bias, and all produced non-significant results with respect to bullying perpetration and victimization. One study failed to report outcomes for some experimental group participants, and no study reported on potential harms. There were insufficient numbers of included studies for us to complete a funnel plot to examine the risk of publication bias.

### **4.1 Program adaptation**

One included study and two excluded studies adapted an existing program (OBPP) used in HICs, providing mixed evidence of its effectiveness across different settings. No study provided information about the program adaptability in the linguistic and cultural contexts of the schools or maintenance of program fidelity. Whilst there is substantial evidence on effective anti-bullying interventions in HICs, we cannot assume that these interventions will be effective in LMICs, where education systems and sociocultural factors are very different. Indeed, the one study included in this review that adapted the OBPP found no overall evidence for its' effectiveness. It is crucial that evidence-based interventions are developed and tested in LMICs, and that all program stakeholders are involved in this process. In particular, including the views of adolescents themselves is likely to greatly enhance program acceptability and feasibility.

The approach by Meyer and Lesch (2000) in developing an intervention informed by an in-depth needs assessment comprising interviews with headmasters, teachers and pupils at the three primary schools involved should be viewed as an encouraging step in the right direction, though it is noted that the resulting intervention was ineffective at reducing bullying. Equally important in future research in this area is the process of locally validating existing standardized measures of bullying from HICs to different LMICs. It is possible that in addition to the concerns about insufficient statistical power, errors resulting from lack of contextually validated measures hindered the existing studies' analyses and results. Among other measurement issues, for example, the definition and measurement of bullying used in the Meyer and Lesch (2000) study "failed to describe the type of aggression" of the students involved (p.65). The development of culturally sensitive indicators of different subtypes of bullying will be particularly important in determining the benefits of anti-bullying interventions delivered in diverse cultural contexts.

#### **4.2 Potential biases in the review process**

A major limitation of the current review is that searches were conducted in English only, and in English-only databases, which is a very common practice among systematic reviews in general. Whilst the majority of studies are written in English and can be located through searching main international databases, up to 15% of studies in LMICs were only found through regional databases (Shenderovich et al. 2016). Although our search was extensive and transparently documented here, we recognize that there may be additional databases that provide more regional relevance which could also have been searched.

Second, it is likely that organizations in LMICs conduct bullying prevention programs that might not be evaluated or published. Whilst we made efforts to contact leading researchers in the field as well as performed a grey literature search, it is possible that such programs may have been missed. Third, whilst studies that passed to a full text review were screened by both authors, the initial searches were conducted by one author (BS) only.

Finally, it should be noted that the World Bank's classification of countries based on income is a dynamic system that is updated every year on the 1<sup>st</sup> of July. This review is based on all the countries that were listed under LMICs between 1<sup>st</sup> July, 2015 to 30<sup>th</sup> June, 2016. Close to 35 countries have moved from upper-middle income countries to high-income countries since 2015, whilst countries such as Russia and Venezuela have stepped down from high-income countries to upper-middle income countries.

### **4.3 Ongoing research programs**

We are aware of two current program evaluations that are of relevance to this review, but that have not yet been published. The SEHER program in Bihar, India, is a multi-component whole-school health promotion intervention targeting adolescents through improving the school climate. The intervention takes place throughout the academic year and includes activities at the school level (e.g. awareness generation activities for all stakeholders in school, wall-magazine, speak-out box, competitions, School Health Promotion Committee, school health policies; at the group-level (peer groups of

students, workshops and talks for all the students; and at the individual-level (counseling and referral services for all the students in the school). The program is currently being evaluated through a large cluster randomized controlled trial with integrated economic and process evaluations among Grade 9 students of 74 government-run secondary schools in Bihar, India (Shinde et al. 2017). Schools have been randomized (1:1:1) to three arms: the SEHER intervention delivered by a lay counselor (the SEHER Mitra (SM) arm), the SEHER intervention delivered by a teacher (Teacher as SM (TSM) arm), and a control arm in which only the classroom-based life-skills Adolescence Education Program. The impact of the program on bullying is being evaluated as a secondary outcome.

Another relevant study is the ROOTS program in Indonesia, based on a program evaluated in America (Paluck, Shepherd, and Aronow, 2016). Funded by Unicef Indonesia, and involving input from review author LB, the program has been adapted to the local context through a process of stakeholder meetings involving teachers, university researchers, adolescents, policy-makers and international consultants. The intervention is adolescent-led; and is based upon the theory that individuals observe the behavior of certain people in their community to understand what is socially normative and adjust their own behavior in response. Adolescent ‘social referents’ who have an enhanced influence over school climate or the social norms and behavioral patterns in their schools are identified through a simple blind voting system, and encouraged to take a public stance against peer violence and bullying through 12 facilitated meetings, including a school-wide ‘ROOTs day’. This type of intervention is low-cost, simple to implement, and utilizes existing social network structures to maximize intervention efficacy and impact rather than involving changes

to school curricula or school management time. Based on stakeholder feedback, the intervention has been developed to include teacher-training on positive discipline. The program is currently being evaluated in a total of 12 schools from two settings (Central Java and South Sulawesi) using a quasi-experimental design.

#### **4.4. Investment in anti-bullying interventions**

Bullying is a major health-risk for adolescents, and has been described as “the most tractable public health problem.” Whilst a large body of evidence supports the effectiveness of a number of anti-bullying interventions in HICs, our systematic review highlights the lack of research in this area in LMICs. It is not clear whether existing programs may be successfully adapted across very different social and educational contexts. Further research is needed on the contextual factors influencing the adoption and adaptation in LMICs of well-validated interventions that have been developed in low resource settings in HICs. In particular, implementation research is needed to ensure the successful adaptation and transfer of school-based interventions for adolescents across educational, cultural and socio-economic settings. It should be noted that materials, training and support for the most rigorously tested, manualized anti-bullying interventions (e.g. OBPP, KiVa (Salmivalli and Poskiparta, 2012) may be considered costly for schools or public service agencies with limited resources, which could be a barrier to implementing these interventions in low-resource settings.

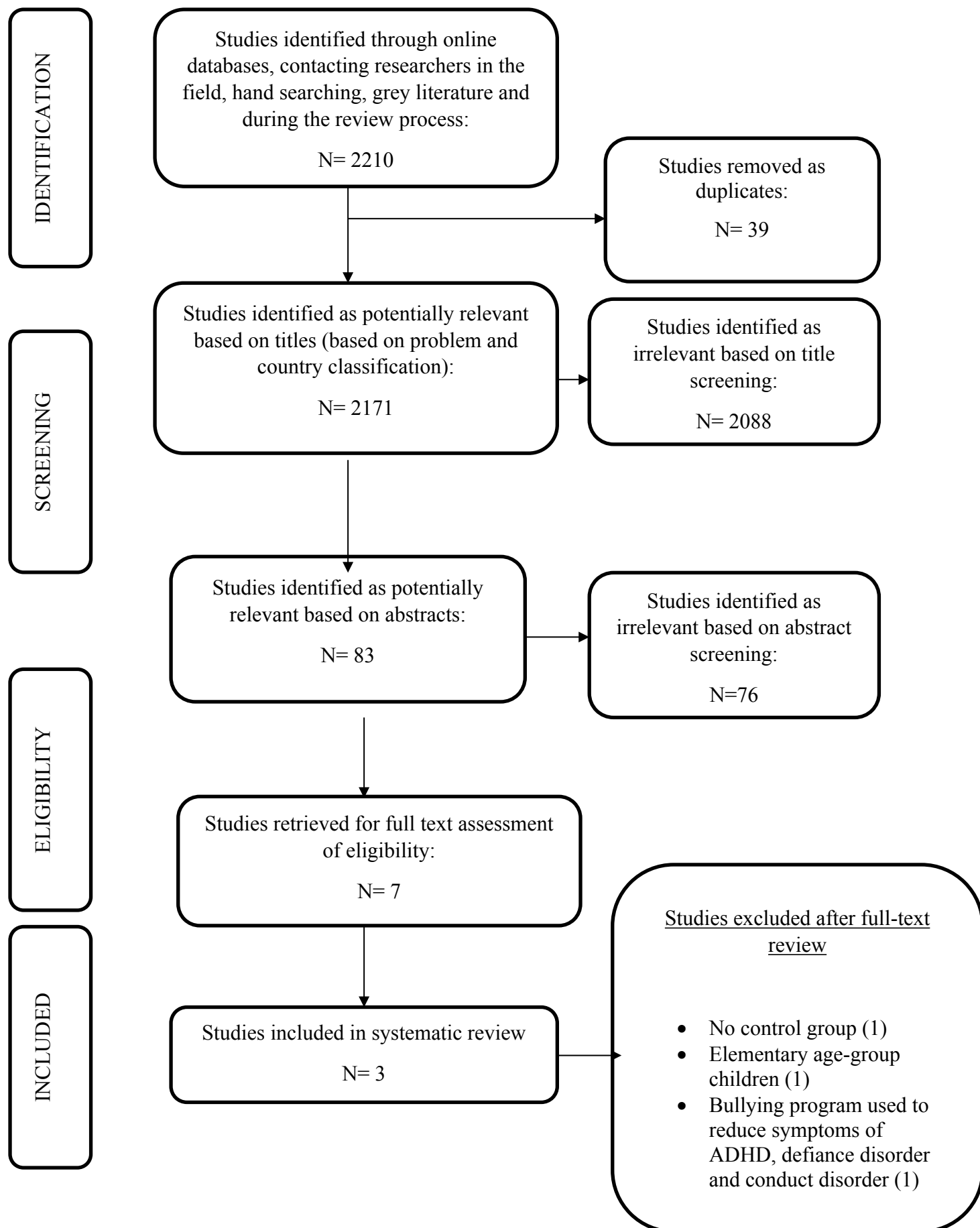
#### **5. Conclusions**

There is increasing recognition of the impact of bullying on adolescent health and wellbeing worldwide. A commitment to eliminate all violence against children under

the Sustainable Development Goals has seen a growth of work in this area. Research is needed to strengthen the evidence-base on the interrelationship between bullying and educational and social wellbeing outcomes in these settings. Such research would strengthen the case for a wide-scale integration of anti-bullying programs into key health, education, and development priorities for young people in LMICs. This may be particularly important in educational settings where the focus is on academic achievement and not promoting student wellbeing more broadly. So that limited resources are not wasted, interventions must be pilot-tested for applicability in diverse educational, social and cultural settings, followed by rigorous evaluation through cluster-randomized trials. Developing capacity in LMICs for the implementation and evaluation of anti-bullying programs is fundamental to promoting and sustaining action for positive adolescent development.



**Figure 1: Flowchart**



**Table 1 : Studies excluded based on abstract screening**

<b>Author</b>	<b>Country</b>	<b>Intervention</b>
Abdirahman et al. 2012	St. Lucia, St Vincent and the Grenadines	No
Abdirahman et al. 2013	Egypt, Libya, Morocco and Tunisia	No
Alikasifoglu et al. 2007	Turkey	No
Amemiya et al. 2009	Peru	No
Arslan et al. 2011	Turkey	No
Azeredo et al. 2015	Brazil	No
Azeredo et al. 2015	HICs and LMICs	No
Balogun and Olapegba. 2007	Nigeria	No
Bayar and Ucanok, 2012	Turkey	No
Boyes et al. 2014	South Africa	No

Chaux and Castellanos. 2015	Colombia	No
Cheraghi and Piskin. 2011	Iran and Turkey	No
Choo et al. 2011	Malaysia	No
Crookston et al. 2014	Peru	No
Cruzeiro et al. 2008	Rio de Janeiro	No
Evgin et al. 2014	Turkey	No
Costa et al. 2015	Brazil	No
de Wet and Jacobs, 2013	South Africa	No
Deniz and Ersoy, 2016	Turkey	No
DeSouzaand Ribeiro, 2005	Brazil (Latin America)	No
Deveci et al. 2008	Turkey	No
Due et al. 2013	HICs and LMICs	No
Dunne et al. 2010	Ghana	No
Dunne et al. 2013	Ghana	No
Egbochuku, 2007	Nigeria	No

Elgar et al. 2015	HICs and LMICs	No
Ercan et al. 2009	Turkey	No
Erginoz et al., 2015	Turkey	No
Eslea et al. 2004	7 countries (Mostly HIC and few LMIC)	No
Ferrett et al. 2011	South Africa	No
Fleming and Jacobsen, 2010	LMIC	No
Gao and Chan, 2015	China	No
Grossi and dosSantos, 2012	LMIC	No
Huang et al. 2013	LMIC	No
Isiklar et al. 2012	Turkey	No
Karaman et al. 2006	Turkey	No
Karatas and Ozurk, 2011	Turkey	No
KoLing and Chan, 2013	China	No
Kshirsagar et al. 2007	India	No

Kubwalo et al. 2013	Malawi	No
Lan et al. 2016	China	No
Li et al. 2015	China	No
Liang et al. 2007	South Africa	No
Lister et al. 2015	Peru	No
Liu et al. 2014	China	No
Malta et al. 2014	Brazil (Latin America)	No
Meinck et al. 2015	South Africa	No
Mosia, 2015	Lesotho	No
Narayanan and Betts, 2014	India	No
Obrdalj and Rumboldt, 2010	Bosnia and Herzegovina	No
Obrdalj and Rumboldt, 2008	Bosnia and Herzegovina	No
Obrdalj et al. 2013	Bosnia and Herzegovina	No
Owusu et al. 2011	Ghana	No
Pengpid and Peltzer, 2013	Thailand	No

Phuong et al. 2013	Vietnam	No
Pigozi and Machado, 2015	Brazil	No
Rech et al. 2013	Brazil	No
Romani et al. 2011	Peru	No
Romera et al. 2011	Nicaragua	No
Rudatsikira et al. 2008	Phillippines	No
Rudatsikira et al. 2014	Algeria	No
Sahin, 2010	Turkey	No
Serra-Negra et al. 2015	Brazil	No
Shaheen et al. 2014	Jordan	No
Shaikh, 2013	Pakistan	No
Siyahhan et al. 2012	Turkey	No
Siziya et al. 2012	Zambia	No
Tam and Zhang, 2012	China	No
Tiliouine, 2015	Algeria	No
Townsend et al. 2008	South Africa	No

Tshotsho and Thwala, 2015	Swaziland	No
Uba et al. 2010	Malaysia	No
Ismail et al. 2014	Malaysia	No
Zhou et al. 2015	China	No
Zhu and Chan, 2015	China	No





**Table 2: Characteristics of excluded studies based on full-text review**

<b>Author</b>	<b>Method</b>	<b>Country</b>	<b>Age</b>	<b>School</b>	<b>Intervention</b>
Obrdalj et al., 2014	Experimental design	Bosnia and Herzegovina	Adolescents	Yes	Yes but no control group
Stelko-Pereira et al., 2016	Experimental design	Brazil	Teachers	Yes	Yes
Dorostkar, 2016	Quasi-experimental design	Iran	Adolescents	Yes	Yes but bullying is not an outcome
Azad and Amiri, 2012	Experimental design	Iran	Elementary school children	Yes	Yes

**Table 3: Characteristics of included studies**

Study	Country	Methods	Participants	Outcomes	Follow up	Effect size (95% CI, if available)	Summary of effects
Meyer and Lesch (2000)	South Africa	Pre-test/post-test experimental design with random allocation at individual level.	12-16 year boys only. N = 54.	Self-reports of perpetration (Meyer, 1996). Secondary outcomes were not particularly specified.	Post-test at 10 weeks (outcome), then follow up at 3 months	Pooled effect size -0.30 (small)	Small, non-significant effects when data pooled across each school.

Yaakub et al. (2010)	Malaysia	Pre-test/post-test experimental design with non-random allocation at school level	3816 adolescents (average age not given) across six secondary schools	Self-reported bullying and victimization (24-item bullying survey, reference not given). Secondary outcomes were not clearly specified.	Post-test (duration of intervention not given), then follow up at 20 months	No data presented	No data presented
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Note: Included studies denoted by ‘\*\*\*’; Excluded studies denoted by ‘\*’.





## **Appendix 1**

List of online databases reviewed (note, searches were conducted between January 1987, when the first credible bullying prevention programs were developed, and 30<sup>th</sup> June 2016).

EMBASE;

Social Sciences Citation Index;

PsychINFO;

ERIC;

Global Health;

CINAHL;

PAIS Index;

Education abstracts;

Humanities index;

Applied Social Sciences index and Abstracts (ASSIA);

Child development and Adolescent studies;

OVID Medline;

National Criminal Justice Reference Service (NCRJS) abstracts database;

International Bibliography of the Social Sciences (IBSS);

PILOTS;

PRISMA;

Social Service abstracts;

Sociological abstracts;

British Education Index;

Science Direct;  
Web of Science Core Collection;  
meta Register for Controlled Trials;  
Scopus;  
Cochrane;  
Campbell Collaboration;  
PubMed;  
Periodicals archive online (Proquest);  
The Guardian and Observer (Proquest);  
Proquest Historical newspapers – Times of India;  
World Cat.

## **Appendix 1.1**

Search terms used:

### **1.1.1 Country Classification**

developing count\*” or “developing nation\*” or “less\* developed count\*” or “less\* developed nation\*” or “third world” or “under developed” or “middle income” or “low income” or “lower-middle income” or “underserved count\*” or “underserved nation\*” or “under served count\*” or “under served nation\*” or “underserved population\*” or “under served population\*” or “deprived count\*” or “deprived nation\*” or “poor\* count\*” or “poor\* nation\*” or lmic OR lmics OR low and middle income country OR low and middle income countries OR “lower middle income count\*”

### **1.1.2 Intervention**

Intervent\* OR program\* OR serv\* OR measur\* OR outcom\* OR evaluat\* OR implement\*

### **1.1.3 Schools**

School\* OR Secondary school OR secondary schools OR higher secondary school\*  
OR Middle school OR middle schools OR high school OR high schools

### **1.1.4 Age**

Adolescen\* OR teen\* OR boy\*OR girl\*

### **1.1.5 Problem**

“anti bullying” OR “anti-bully” OR anti bully OR antibull\* OR “whole-school” OR  
“whole school\*” OR whole-school\* OR “school-based anti-bullying intervention\*”  
OR “school based anti bull\* program\*”

### **1.1.6 Target population**

Bull\* OR perpetrat\* OR victim\* OR “bully-victim\*” OR bystander\*

### **1.1.7 LMICs**

Afghanistan or Albania or Algeria or Angola or Armenia or Armenian or Azerbaijan or Bangladesh or Benin or Byelarus or Byelorussian or Belarus or Belorussian or Belorussia or Belize or Bhutan or Bolivia or Bosnia or Herzegovina or Hercegovina or “Bosnia and Herzegovina” or Botswana or Brasil or Brazil or Bulgaria or “Burkina Faso” or “Burkina Fasso” or Burundi or Cambodia or Cameroon or China or Cameroons or Cameron or Camerons or “Cape Verde” or “Central African Republic” or Chad or Colombia or Comoros or “Comoro Islands” or Comores or Congo or Zaire or “Costa Rica” or “Cote d'Ivoire” or “Ivory Coast” or Cuba or Djibouti or “French Somaliland” or Dominica or “Dominican Republic” or “East Timor” or “East Timur” or “Timor Leste” or Ecuador or Egypt or “United Arab Republic” or “El Salvador” or Eritrea or Ethiopia or Fiji or Gabon or “Gabonese Republic” or Gambia or Gaza or “West Bank” OR or Ghana or Grenada or Guatemala or Guinea or Guam or Guiana or Guyana or Haiti or Honduras or Hungary or India or Maldives or Indonesia or Iran or Iraq or Jamaica or Jordan or Kazakhstan or Kazakh or Kenya or Kiribati or “Korea Democratic Republic” or Kosovo or Kyrgyzstan or Kirghizia or Kyrgyz Republic or Kirghiz or Kirgizstan or “Lao PDR” or Laos or Lebanon or Lesotho or Basutoland or Liberia or Libya or Macedonia or Madagascar or Malagasy Republic or Malaysia or Malaya or Malay or Malawi or Nyasaland or Mali or “Marshall Islands” or Mauritania or Mauritius or “Agalega Islands” or Mexico or Micronesia or Moldova or Moldovia or Moldovian or Mongolia or Montenegro or Morocco or Ifni or Mozambique or Myanmar or Myanma or Burma or Namibia or Nepal or Nicaragua or Niger or Nigeria or Pakistan or Palau or Panama or Paraguay or Peru or Philippines or Philipines or Phillipines or Phillippines or Romania or Rumania or Roumania or Rwanda or Ruanda or “Saint Lucia” or “St Lucia” or “Saint Vincent” or “St Vincent”

or Grenadines or Samoa or “Samoa Islands” or “Navigator Island\*” or “Sao Tome” or Senegal or Serbia or Montenegro or Seychelles or “Sierra Leone” or “Sri Lanka” or Ceylon or “Solomon Islands” or Somalia or South Africa or Sudan or Suriname or Surinam or Swaziland or Syria or Tajikistan or Tadjhikistan or Tadjikistan or Tadjhik or Tanzania or Thailand or Togo or “Togolese Republic” or Tonga or Tunisia or Turkey or Turkmenistan or Turkmen or Uganda or Ukraine or Uzbekistan or Uzbek or Vanuatu or New Hebrides or Vietnam or “Viet Nam” or “West Bank and Gaza” or Yemen or Zambia or Zimbabwe or Rhodesia

#### **1.1.8 Methodology**

“Randomized control\* trial\*” OR “control\* trial\*” OR random\* OR “randomized control trial” OR “meta-analysis” OR “quasi-experiment\*design\*” OR “experiment\*design\*” OR “random\* trail\*”