A Systematic Review of School-Based Interventions to Prevent Bullying

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Objective: To conduct a systematic review of rigorously evaluated school-based interventions to decrease bullying.

Data Sources: MEDLINE, PsycINFO, EMBASE, Educational Resources Information Center, Cochrane Collaboration, the Physical Education Index, and Sociology: A SAGE Full-Text Collection were searched for the terms *bullying* and *bully*.

Study Selection: We found 2090 article citations and reviewed the references of relevant articles. Two reviewers critically evaluated 56 articles and found 26 studies that met the inclusion criteria.

Interventions: The types of interventions could be categorized as curriculum (10 studies), multidisciplinary or "whole-school" interventions (10 studies), social skills groups (4 studies), mentoring (1 study), and social worker support (1 study).

Main Outcome Measures: Data were extracted regarding direct outcome measures of bullying (bullying, victimization, aggressive behavior, and school responses to violence) and outcomes indirectly related to bullying (school achievement, perceived school safety, self-esteem, and knowledge or attitudes toward bullying).

Results: Only 4 of the 10 curriculum studies showed decreased bullying, but 3 of those 4 also showed no improvement in some populations. Of the 10 studies evaluating the whole-school approach, 7 revealed decreased bullying, with younger children having fewer positive effects. Three of the social skills training studies showed no clear bullying reduction. The mentoring study found decreased bullying for mentored children. The study of increased school social workers found decreased bullying, truancy, theft, and drug use.

Conclusions: Many school-based interventions directly reduce bullying, with better results for interventions that involve multiple disciplines. Curricular changes less often affect bullying behaviors. Outcomes indirectly related to bullying are not consistently improved by these interventions.

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BULLYING IS A FORM OF AGgression in which 1 or more children repeatedly and intentionally intimidate, harass, or physically harm a victim.[1] Victims of bullying are perceived by their peers as physically or psychologically weaker than the aggressor(s), and victims perceive themselves as unable to retaliate.[2] Although bullying, harassment, and victimization can take many forms, the key elements of this behavior are aggression, repetition, and the context of a relationship with an imbalance of power.[3]

Bullying can impact the physical, emotional, and social health of the children involved. Victims of bullying more often report sleep disturbances, enuresis, abdominal pain, headaches, and feeling sad than children who are not bullied.[4,5] Bullies, their victims, and those who are both bullies and victims have significantly increased risk for depressive symptoms and suicidal ideation.[6,7] Students who report victimization are 3 to 4 times more likely to report anxiety symptoms than uninvolved children.[8,9] The effects of bullying on emotional health may persist over time; 1 study[10] showed that children bullied repeatedly through middle adolescence had lower self-esteem and more depressive symptoms as adults. Victims of bullying are more likely to feel socially rejected or isolated and to experience greater social marginalization and lower social status.[11]

Bullying impacts a child's experience of school on numerous levels. Bullying creates problems with school adjustment and bonding, affecting the victims' completion of homework or desire to do well at school.[6,12] In 1 study,[13] 20% of grade-school children reported being frightened through much of the school day. Bullying seems to increase school absenteeism,

with victimized children becoming more school avoid-ant as the victimization increases.[14] Furthermore, in-volvement in bullying affects academic performance, al-though studies[15-18] show mixed results regarding which children are most affected. Most bullying takes place at school, particularly at times and places where supervi-sion is minimal.[19] Schools where adults tolerate more bul-lying may have more severe bullying problems.[10]

As school bullying increasingly becomes a topic of pub-lic concern and research efforts, a growing number of stud-ies examines school-based interventions targeted to re-duce bullying. Although many of these interventions have been rigorously evaluated, the evaluations reveal mixed results.[20] For example, evaluations of the Olweus Bully-ing Prevention Program, a comprehensive "whole-school" intervention on which many subsequent pro-grams have been based, report reductions of 30% to 70% in the student reports of being bullied and bullying oth-ers.[2,20-22] In contrast, evaluation of a similar comprehen-sive prevention program implemented in Belgium did not show significant differences in victimization or bullying scores among primary or secondary school students.[23] Al-though some review articles have described several of these interventions, to our knowledge, no systematic reviews of interventions to reduce bullying have been published in peer-reviewed literature. The objective of this study was to review rigorously evaluated school-based inter-ventions to reduce or prevent bullying with the goal of determining whether these interventions worked.

METHODS

We searched several bibliographic databases, including MEDLINE (January 1, 1966, through August 23, 2004), PsycINFO, EMBASE, Educational Resources Information Center, the Physical Edu-cation Index, Sociology: A SAGE Full-Text Collection, and the Cochrane Clinical Trials Registry (all as of August 23, 2004). We used the search terms *bullying* or *bully* as Medical Subject Headings or keywords. We used a keyword search because it was more robust than searches using only Medical Subject Head-ings. One of us (R.C.V.) reviewed the titles of all returned ar-ticles and the bibliographies of all relevant review articles to determine which studies examined a school-based interven-tion to prevent or reduce bullying. Articles were immediately excluded if they obviously did not include an intervention or did not occur at a school.

After articles that clearly did not meet the inclusion crite-ria were excluded, both of us (R.C.V. and A.E.C.), blinded to the journal citation and article text other than the "Methods" section, independently reviewed the articles. The 2 reviewers independently decided on trial inclusion using a standard form with predetermined eligibility criteria. Disagreements were re-solved by consensus reached after discussion. For inclusion, a study needed to describe an experimental intervention with con-trol and intervention groups and to include a follow-up evalu-ation with measured outcomes. In addition, the intervention needed to be school based and designed to reduce or prevent bullying. Each article was analyzed to determine the study method, intervention components, outcomes measured, and re-sults. There was no assessment of quality in choosing or evalu-ating study outcomes beyond the inclusion criteria. We did not exclude or discount studies based on baseline similarities among treatment groups, study power, retention rates, or program in-tensity because these characteristics are not associated defini-

tively with the strength of treatment effects.[24] Duplicate pub-lications or multiple articles that reported identical outcomes measured over the same period on the same population were excluded.

We extracted data from the selected articles regarding di-rect outcome measures of bullying, including bullying, victim-ization, aggressive behavior, violence, school responses to vio-lence, and violent injuries. Data were also extracted for outcomes thought to be indirectly related to bullying, such as school achievement, perception of school safety, self-esteem, or knowl-edge about or attitudes toward bullying.

RESULTS

The systematic literature search identified 2090 articles. The online search of MEDLINE yielded 353 articles, and the search of EMBASE yielded 269 articles, 9 of which were not found by the MEDLINE search. The search of PsycINFO yielded 897 articles, Educational Re-sources Information Center yielded 552 articles, the Physi-cal Education Index yielded 16 articles, and Sociology: A SAGE Full-Text Collection yielded 3 articles. An addi-tional 4 potential studies[25-28] were identified through searches of bibliographies and were also reviewed. Once articles that obviously did not address school-based in-terventions were excluded, 321 relevant articles re-mained. Reviewing the abstracts of these articles allowed for the further exclusion of articles that did not address school-based interventions. Fifty-six articles were then as-sessed by both of the reviewers. Articles were most com-monly excluded at this stage because they were not evalu-ations of interventions, they did not have control groups, or they did not address bullying.

The 26 studies that met the selection criteria varied substantially in intervention type, study population, study design, and outcome measures. The detailed character-istics of the studies are reported in **Table 1**. The inter-ventions could be divided into 5 categories: curriculum interventions, multidisciplinary or whole-school inter-ventions, targeted social and behavioral skills groups, men-toring, and increased social work support. To maximize clarity and clinical usefulness, we present the subse-quent results of the review based on the type of inter-vention. All 26 studies investigated interventions for some group of primary school students, but the primary grade levels varied from first to eighth grade. Six stud-ies[22,23,30,39,41,48] included secondary school students (older than eighth grade) in their interventions and outcomes. The selected studies reported a range of outcomes that were subsequently categorized into direct and indirect outcomes. The direct and indirect outcomes of all of the studies are reported in **Table 2**.

CURRICULUM INTERVENTIONS

Ten studies[23,26,29-36] evaluated the implementation of new curriculum. The curriculum interventions included vid-eotapes, lectures, and written curriculum, and varied in intensity from a single videotape followed by classroom discussion to 15 weeks of classroom modules. The de-tails of the study designs, participants, intervention type, and important outcomes of the curriculum interven-

Table 1. Study Characteristics

Source	Country	Subjects	Control Group	Intervention Group	Grade Level or Age Group	Study Design	Intervention	Educational Theory*	Method of Group Assignment
Curriculum Interventions									
Baldry and Farrington,[29] 2004	Italy	239 students in 10 classes	106 students	131 students	Aged 10-16 y	Pretest, posttest, randomized, controlled trial	3-d intervention program (3-h sessions, once a week, for 3 wk)	Social cognitive competence skills	Random allocation by class
Boulton and Flemington,[30] 1996	United Kingdom	170 students in 8 classes at 1 school	4 classes	4 classes	Grades 7-10 (aged 11-14 y)	Randomized matched pairs	Short videotaped intervention ("Sticks and Stones") with class discussion	Not given	One class in each year randomized to the intervention group
Cowie et al,[26] 1994	United Kingdom	2 schools, 16 classes, 148 students	5 classes	11 classes	Aged 7-12 y	Pretest, posttest, control group design	Cooperative group work curriculum	Cooperative group work, effect on interpersonal relationships	Schools selected based on interest
Elliott and Faupel,[31] 1997	United Kingdom	64 students	32 students	32 students	Grades 4 and 5	Pretest, posttest, randomized, controlled trial	Videotape and curriculum	Group interpersonal problem solving	Randomized by student
Englert,[32] 1999	United States	71 students in 3 classes	23 students (1 class)	24 students in the problem-solving group (1 class) and 24 students in the cooperative task group (1 class)	Grade 4	Pretest, posttest, control group design	2 curricula: one in problem-solving training and one in cooperative task development	Problem-solving and cooperative task development	Assigned by class
Kaiser-Ulrey,[33] 2003	United States	125 students	67 students	58 students	Grade 7	Pretest, posttest, control group design	12-wk antibullying curriculum	Psychoeducation, empathy, problem-solving, dissemination	Assigned in cohort groups
Rican et al,[34] 1996	Czechoslovakia	198 students in 8 classes	98 students	100 students	Grade 4 (median age, 10 y)	Pretest, posttest, control group design	Videotape, curriculum changes, "class charter"	Not given	Assigned by class
Stevens et al,[23] 2000	Belgium	24 schools total (728 primary school students and 1465 secondary school students)	193 primary school students and 229 secondary school students	130 primary school students and 219 secondary school students	Primary and secondary schools	Pretest, posttest, randomized, controlled trial	Videotape, curriculum changes, "class charter," role-playing within classes	Social cognitive orientation emphasizing cognitive perspective taking, problem-solving strategies, and social skills	Randomly assigned by school to experimental or control group
Teglasi and Rothman,[35] 2001	United States	59 students: 17 "aggressive" and 42 "nonaggressive"	8 aggressive students	8 aggressive students	Grades 4 and 5	Pretest, posttest, time-lagged comparison	15-wk curriculum	Social problem-solving skills; reorganization of schemas for social information processing and problem-solving through experiential learning	Partial randomization: nonaggressive children randomly placed in groups of 4; 1-2 aggressive children randomly selected, added to groups
Warden et al,[36] 1997	United Kingdom	120 students in 6 schools	60 students (10 from each of the 2 primary classes in each of 6 schools)	60 students (10 from each of the 2 primary classes in each of 6 schools)	Aged 6 and 10 y	Pretest, posttest, randomized, controlled design	Kidscape Children's Safety Training Program curriculum implemented over 4 wk	General safety rules applied with specific stories and role plays	Kids randomly selected within school groups, but 3 intervention schools selected the program

(continued)

tions are all described in Table 1. The studies all used a pretest, posttest, control group design; 6 of the 10 studies randomized the assignment of the groups.[23,29-31,35,36]

The curriculum interventions did not consistently decrease bullying, and several actually suggested that the bullying within the intervention group increased (Table 2). Of the 10 studies of curriculum interventions, 6 showed no significant improvements in bullying.[23,26,30,32,33,36] Although bullying and victimization did not change significantly, Boulton and Flemington[30] did find that the students in the intervention group broadened their definition of bullying slightly, and Englert[32] found that the teachers reported a significant decrease in observed physical and verbal violence ($P<.01$).

Table 1. Study Characteristics (cont)

Source	Country	Subjects	Control Group	Intervention Group	Grade Level or Age Group	Study Design	Intervention	Educational Theory*	Method of Group Assignment
Multidisciplinary or "Whole-School" Interventions								
Alsaker and Valkanover,[25] 2001	Switzerland	319 students in 16 kindergartens	8 kindergartens (n = 152)	8 kindergartens (n = 167)	Kindergarten (aged 5-7 y)	Pretest, posttest, control group design	Whole-school approach	Teacher training on whole-school approach with emphasis on rules and social-cognitive skills	By school; interested teachers selected for the intervention
Melton et al,[28] 1998	United States	6389 students in 39 schools	Year 1: 28 schools; year 2: 21 schools	Year 1: 11 schools; year 2: 18 schools	Grades 4-6 (aged 9-11 y)	Pretest, posttest, control group design	Whole-school approach	Interventions at level of school, curriculum, individual students; materials for school staff and involved community members	Districts matched by demographics; one district in each pair assigned to first year of intervention
Menesini et al,[37] 2003	Italy	293 students in 2 middle schools	5 classes (n = 115)	9 classes (n = 178)	Grades 6-8	Pretest, posttest, control group design	"Befriending" intervention	Training and implementation of peer supporters within schools	Assigned by class based on teacher's willingness to participate
Metzler et al,[38] 2001	United States	1403 students in 3 middle schools	2 schools (n = 758)	1 school (n = 645)	Grades 6-8	Pretest, posttest, control group design	Comprehensive behavior management program	Rule system, training, increased praise systems	Assigned by school
Mitchell et al,[39] 2000	Australia	38 schools, primary and secondary	18 schools	21 schools	Primary and secondary	Pretest, posttest, randomized, controlled design	Health-promoting schools intervention	School staff workshop, resource kit for school, network meetings for staff, financial support for school-based activities	Randomized by school
Olweus,[22] 1994	Norway	2500 students in 42 primary and secondary schools	NA	NA	Primary and secondary	Quasi-experimental with time-lagged age cohort	Whole-school approach	Teacher training, parent advice, videotaped curriculum, feedback for staff; emphasis on rules and sanctions	Time-lagged cohorts, not randomized
Rahey and Criag,[40] 2002	Canada	491 students in 2 primary schools	1 school (n = 251)	1 school (n = 240)	Grades 1-8	Pretest, posttest, control group design	Whole-school program implemented over 12 wk	Curriculum, peer mediation program, groups for bullies and victims, teacher training; emphasis on conflict resolution, empathy, and listening skills	Assigned by school
Roland,[41] 2000	Norway	7000 students in 37 primary and secondary schools	NA	NA	Primary and secondary students	Age-cohort design with time-lagged comparisons	Whole-school approach	Teacher training, curriculum; emphasis on rules and sanctions	Time-lagged cohorts, not randomized
Sanchez et al,[42] 2001	United States	747 students at 12 schools	6 schools (n = 378-380)	6 schools (n = 362-367)	Grade 5	Pretest, posttest, randomized, matched pairs, controlled design	Whole-school approach	"Expect Respect Model" with classroom curriculum, staff training, policy development, and support services for individuals	6 pairs of matched schools, 1 school in each pair randomly assigned to the intervention
Twemlow et al,[43] 2001	United States	110 students at 2 schools	1 school (n = 64)	1 school (n = 46)	Primary school	Pretest, posttest, control group design	Whole-school approach	Social systems/psychodynamic intervention, including "zero tolerance," discipline plan, physical education plan, and mentoring program	Assigned by school; method not given

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Table 1. Study Characteristics (cont)

Source	Country	Subjects	Control Group	Intervention Group	Grade Level or Age Group	Study Design	Intervention	Educational Theory*	Method of Group Assignment
Social and Behavioral Skills Group Training Interventions									
DeRosier,[44] 2004	United States	415 students with significant peer relationship difficulties	n = 217	n = 198	Grade 3	Pretest, posttest, randomized, controlled design	"S.S. GRIN" social skills group training	Social learning and cognitive behavioral techniques	Random assignment by student
Fast et al,[45] 2003	United States	127 students	n = 105	n = 22 (12 aggressive and 10 nonaggressive students)	Grade 7	Quasi-experimental intervention for aggressive students only; no matched control	Peer mediator group training	Peer mediation to improve individual behavior and affect social norms	Selected based on aggression level
Meyer and Lesch,[46] 2000	South Africa	54 students at 3 schools, all males identified as bullies	n = 18	Interventional behavioral skills group (n = 18) and supportive play group (n = 18)	Grades 6-7	Pretest, posttest, randomized, matched pairs with control design	Behavioral skills group	Social interactional model for behavioral skills development	Matched by aggression level, then randomly allocated to experimental condition
Tierney and Dowd,[47] 2000	United Kingdom	30 students with emotional and behavioral concerns, including victimization	n = 15	n = 15	Grade 8	Pretest, posttest, matched cohort	Social skills training group (6 sessions)	Social skills training on speaking/ listening, friendships, bullying, knowing one's self, and knowing others	Students selected if "causing concern"; matched to control
Other Interventions									
Bagley and Pritchard,[48] 1998	United Kingdom	670 students at 2 primary schools and 2 secondary schools	1 primary and 1 secondary school	1 primary and 1 secondary school	Primary and secondary	Pretest, posttest, control group design	Increased social workers	Focus on family and child counseling and on addressing bullying	Assigned by school
King et al,[49] 2002	United States	311 fourth-grade students at 1 school	Nonmentored students (n = 283)	"At risk" students (n = 28)	Grade 4	Cohort study	Mentoring program twice a week	Focus on relationship building, self-esteem enhancement, goal setting, and tutoring	Students selected based on risky health behaviors, depression, and risk for school failure

Abbreviation: NA, data not applicable.
*For multidisciplinary or whole-school interventions, components are given.

Of the 4 studies that did show less bullying after a curriculum intervention, 3 also showed more bullying or victimization in certain populations or with certain measurement tools.[29,34,35] The study by Baldry and Farrington[29] showed a decrease in self-reported victimization among older children (*P*<.05), but younger children actually reported more victimization (*P*<.01), and there were no significant differences in either victimization or bullying overall. Teglasi and Rothman[35] found that teachers reported decreased antisocial behavior for children not identified as aggressive and increased aggressive behavior for the children previously identified as aggressive (*P*<.01 for both). The individual self-reports for aggression did not reveal any significant effects from the intervention. A study by Rican et al[34] found significant decreases in peer nominations of bullying (*P*=.02) and victims (*P*=.03) using unspecified "broad criteria," but no change in victimization using "narrower criteria." Only 1 curriculum intervention showed unequivocal improvements, and this was in an indirect outcome. The randomized trial of Elliott and Faupel[31] of a group problem-solving curriculum resulted in increased generation of responses to a simulated bullying situation by the intervention group.

WHOLE-SCHOOL MULTIDISCIPLINARY INTERVENTIONS

Ten studies[22,25,28,37-43] evaluated interventions using a multidisciplinary whole-school approach that included some combination of schoolwide rules and sanctions, teacher training, classroom curriculum, conflict resolution training, and individual counseling. Table 1 describes the components of each of these multidisciplinary studies in detail. The whole-school studies involved more subjects than the curriculum interventions, with up to 42 schools in a single study. Only 2 of the studies[39,41] evaluated interventions among secondary school students, and the rest looked at primary schools. In contrast to the curriculum studies, only 2 of the whole-school studies incorporated randomization in their study design. Two of the studies[41,50] used a quasi-experimental design with time-lagged age cohorts.

Two studies, both evaluating the seminal Olweus Bullying Prevention Program, revealed disparate results. The Olweus Bullying Prevention Program pioneered the whole-school approach to preventing and reducing bullying with an intervention program in Bergen, Norway, that included training for school personnel, materials for

Table 2. Study Outcomes by Intervention Type

Source	Intervention Type	Direct Outcomes: Bullying, Aggressive Behavior, Violence, and School Responses to Violence	Indirect Outcomes: School Achievement, Perceived School Safety, Self-esteem, and Knowledge or Attitudes About Bullying
Baldry and Farrington,[29] 2004	Curriculum	No difference in victimization or bullying overall ($P = .08$); less victimization in older students (aged 14-16 y) ($t = -2.19$, $P<.05$); worse victimization for younger students ($t = 2.73$, $P<.01$)	Not measured
Boulton and Flemington,[30] 1996	Curriculum	No significant change in bullying others	No significant difference in attitudes toward bullying; did broaden definition of bullying slightly to include name-calling ($P = .40$), telling nasty stories about other people ($P = .55$), and forcing people to do things they do not want to do ($P<.05$)
Cowie et al,[26] 1994	Curriculum	No significant effect on bullying behavior (increase in both groups); small decrease in reporting of victimization	Not measured
Elliott and Faupel,[31] 1997	Curriculum	Not measured	Improved generation of responses to bullying: group interpersonal problem-solving curriculum producing 3 times more solutions (105 responses) than control group (32 responses)
Englert,[32] 1999	Curriculum	No change from children's reports; no statistically significant difference for individual classrooms; control classroom students reported significantly fewer incidents of being bullied than problem-solving classroom students before and after the intervention ($P<.01$); teacher observations of significant decrease in observed physical and verbal violence, with mean scores decreasing from 3.40 to 1.60 ($P<.01$) for the problem-solving group and mean scores decreasing from 3.80 to 1.40 ($P<.01$) for the cooperative task group	No change; neither intervention group showed significant improvement in problem solving vs the control group ($P<.01$); no significant differences in self-esteem scores preintervention and postintervention; cooperative task classroom actually had significantly lower self-esteem scores than problem-solving or control classroom postintervention ($P<.05$)
Kaiser-Ulrey,[33] 2003	Curriculum	No change; MANCOVA for outcomes of bullying incidence, victimization incidence, prosocial behaviors, and parental involvement revealed no significant multivariate effect between groups; nonparametric analysis of evidence of bullying and victimization revealed no improvement	Improved social skills; MANCOVA for outcomes of empathy, prosocial behaviors, global self-esteem, and parental involvement revealed no significant multivariate effect between the groups; nonparametric analysis of social skills development, talking to friends about bullying, talking to parents about bullying, and program success revealed no improvement, except for improved social skills in the intervention group ($P = .01$)
Rican et al,[34] 1996	Curriculum	Improvement in bullying: intervention classes had significantly fewer bullies nominated by peers after the intervention (7.1% compared with 11.2% using "broader criterion" to define bullies; $P = .02$); decreased victimization by some criteria: victims defined by a broader criterion (7.1% in intervention classes compared with 14.3% in control classes ($P = .03$); for "narrower criterion," the intervention group did not have a significant change in percentage of victims, but still had a significant change in percentage of bullies ($P = .02$)	Not measured
Stevens et al,[23] 2000	Curriculum	No significant change for primary students in involvement in bully-victim behaviors ($P<.07$); no significant change for secondary students at posttest 2	No significant changes for primary or secondary students in attitude toward bullies and victims, self-efficacy, and intention to intervene
Teglasi and Rothman,[35] 2001	Curriculum	Improved for nonaggressive children; worsened for aggressive children; teacher reports showed decreases in externalizing and antisocial behaviors for children not identified as aggressive ($P<.01$) and increases in externalizing aggressive behavior for children previously identified as aggressive ($P<.01$); a χ^2 analysis of the relationship between identification status and treatment response indicated aggressive children were more likely to have a low response rate ($P<.001$); less externalizing children respond better to treatment ($P<.001$); individual self-reports did not reveal any significant effects from the intervention	Not measured
Warden et al,[36] 1997	Curriculum	Not measured	No improvement in responses to bullying situation for either 6- or 10-year-old children; for other safety situations, responses of the intervention group were rated as significantly more safe than those of the untrained control group; responses of older children were rated as significantly safer than those of younger children on all 3 testings ($P<.001$)
Alsaker and Valkanover,[25] 2001	Multidisciplinary	No changes in teacher or child reports of bullying behavior; decreased victimization on teacher and child reports; on peer reports, the intervention group had a 15% reduction in the proportion of children nominated as victims by peers in contrast with a 55% increase in children in the control group nominated as victims; teacher reports showed reduction in physical bullying and indirect bullying through isolation, but an increase in verbal bullying; neither children's peer nominations nor teacher ratings showed any evidence of decrease in bullying behaviors in the intervention or control group; children's reports in both groups showed a slight increase in nominations of bullying (no statistics given)	Increased awareness of school rules regarding bullying
Melton et al,[28] 1998	Multidisciplinary	After 2 y of the intervention, no significant differences in bullying, antisocial behavior, or victimization (victimization increased in both groups); no significant change in victimization rates in intervention schools at year 1 or 2; intervention schools did have a decline in the rate of bullying by 20% after the first year of the intervention (in contrast with a 9% increase in bullying rates in the control schools), but after 2 y of the intervention, there were no significant differences in bullying, general antisocial behaviors, or attitudes toward bullying between the intervention and control students; no significant program effects for 7 original control schools that received only 1 y of the intervention	No differences in attitudes toward bullying

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Table 2. Study Outcomes by Intervention Type (cont)

Source	Intervention Type	Direct Outcomes: Bullying, Aggressive Behavior, Violence, and School Responses to Violence	Indirect Outcomes: School Achievement, Perceived School Safety, Self-esteem, and Knowledge or Attitudes About Bullying
Menesini et al,[37] 2003	Multidisciplinary	Bullying remained stable for the intervention group (although it increased for the control group); no change in victim or defendant scales; levels of bullying or probullying behaviors in the intervention group remained stable, whereas probullying scales increased in the control group ($P<.05$)	No decrease in provictim attitudes as seen in the control group
Metzler et al,[38] 2001	Multidisciplinary	Improved discipline referrals for seventh graders ($P = .04$); improved harassment among males ($P = .02$); no changes for sixth and eighth graders; no change in physical or verbal attacks	Improved perception of safety for sixth graders (59.3%-75.6% at the first year to 72.2% at the second year) and seventh graders (56.4%-60.2% at the first year to 69% at the second year); no change for eighth graders, nor in the comparison school
Mitchell et al,[39] 2000	Multidisciplinary	Not measured	Improved awareness of health-promoting school concept with significantly greater proportion of staff hearing of health-promoting school concept ($P = .04$), reading relevant material ($P<.001$), and attending in-service training on health-promoting schools ($P<.001$); no significant changes in health-related policies or practices occurred in the intervention group, including those related to bullying
Olweus,[22] 1994	Multidisciplinary	Decreased level of bully-victim problems, peer reports of bullying, and general antisocial behavior; for outcomes of bullying others, boys averaged a 16% reduction and girls averaged a 30% reduction after 8 mo; after 20 mo, reductions averaged 35% for boys and 74% for girls; reductions in victimization averaged 48% for boys after 8 mo and 58% for girls; reductions increased to 52% for boys and 62% for girls after 20 mo	Improved, with better social climate and satisfaction with the school
Rahey and Criag,[40] 2002	Multidisciplinary	No significant decrease in bullying; decreased level of victimization ($P<.05$) and peer isolation ($P<.01$) for older students (grades 5-8); increased level of victimization ($P<.05$) and exclusion ($P<.01$) for younger students (grades 1-4)	Improved perception of school safety ($P<.01$) and being well liked ($P<.001$) for older students (grades 3-8); worsened perception of school safety ($P<.01$) and of being well liked ($P<.01$) for younger students (grades 1-2)
Roland,[41] 2000	Multidisciplinary	Increase in bullying (a 24% increase in boys and a 14% increase in girls); increased victimization in boys (by 44%); increased social exclusion for boys (by 12.5%); more positive outcomes for schools implementing programs fully	Not reported
Sanchez et al,[42] 2001	Multidisciplinary	Not measured	No significant increase in knowledge of bullying; intervention students more likely to report seeing bullying ($P<.05$) and expressed greater readiness to intervene personally ($P<.05$); intervention students were less likely to tell an adult about bullying ($P<.05$)
Twemlow et al,[43] 2001	Multidisciplinary	Improved discipline referrals and suspension rates; disciplinary referrals decreased from 74 for physical aggressiveness in 1994-1995 to 34 after the first year of the intervention, and stabilized at 36 during the second year of the intervention; referrals for other infractions went from 162 to 97 after the first year, and to 93 after the second year; suspension rates were significantly lower in the intervention group, at about 9% after the first year ($P<.02$) and 4% after the second year ($P<.004$) (the control school suspension rate did not vary significantly, ranging between 14% and 19%)	Improved academic achievement scores (from 40th to 58th percentile for third and fifth graders), whereas the control school did not change over the same period
DeRosier,[44] 2004	Social skills group	Significantly improved aggression on peer report ($P<.001$); improved bullying behavior on self-report ($P<.05$); fewer antisocial affiliations on self-report ($P<.05$) only for children who were more aggressive at baseline	Improved peer liking ($P<.05$); improved self esteem ($P<.05$); improved self-efficacy ($P<.05$); improved social anxiety ($P<.05$) for all children in the treatment group; significant multivariate main effect for treatment condition ($P<.05$)
Fast et al,[45] 2003	Social skills group	No significant change in discipline referrals, aggressive behavior, or impulsivity; improved scores on teachers' Behavior Rating Index for Children for highly aggressive students, with a difference in means of 9.05 ($P<.05$)	Improved self-concept for highly aggressive students by an average of 11.33 points ($P<.05$), while the remainder of the class had a declining self-concept ($P<.05$)
Meyer and Lesch,[46] 2000	Social skills group	No improvement in bullying on peer reports or self-reports	Not measured
Tierney and Dowd,[47] 2000	Social skills group	Improved interactions with peers by teacher report; no clear change in victimization on self-report	Decreased level of teacher worry; significant progress in areas of friendships and behavior on teacher reports, but no significant change in level of happiness or confidence
Bagley and Pritchard,[48] 1998	Increased social workers by 2.5 workers	Improved bullying in primary school and no improvement in secondary school; improved theft, truancy, fighting, and drug use in primary and secondary schools ($P<.05$); primary project school's self-reports of bullying incidents went from 28% to 22%, a 21% decrease, with $P<.05$ (control school rates went from 28% to 30%, a 7% increase); secondary intervention school's self-reported rates of bully or bullied involvement went from 10% to 12% (a 20% increase), while control school went from 14% to 13% (a 7% decrease)	Not measured
King et al,[49] 2002	Mentoring program	Improved bullying and fighting; at posttest, mentored students were significantly less likely to have bullied a peer in the past 30 d ($t_{27} = 3.47$, $P<.002$) and to have physically fought with a peer in the past 30 d ($t_{27} = 3.48$, $P<.001$) than at pretest (results not compared with the control group)	Less depression ($t_{27} = 2.97$, $P = .006$); significant improvements in mentored students' overall self-esteem, school connectedness, peer connectedness, and family connectedness; compared with control group children, the mentored group achieved significantly higher school connectedness and family connectedness, but self-esteem and peer connectedness did not differ significantly; of the 28 students in the program, 20 (71%) showed academic letter-grade improvements from the first quarter

Abbreviation: MANCOVA, multiple analysis of covariance.

parents, a videotaped classroom curriculum, and evaluation through the bullying questionnaire developed by Olweus.[50] By using unspecified composite measures involving student questionnaires and teacher ratings, the follow-up evaluation found decreased bullying, decreased victimization, decreased antisocial behavior, and improved school climate after the intervention.[22,51] Evaluation of the nationwide Olweus Bullying Prevention Program in Rogaland, Norway, revealed strikingly different results. Roland[27,41] reported increased victimization and social exclusion for boys, and increased bullying for boys and girls based on student self-reports. Unlike in Olweus' protocol, the schools in this sample did not interact with the researchers during the intervention. The schools' degree of involvement in the program was directly related to positive effects from the antibullying program, particularly for girls. Although the evaluations apparently involved the same nationwide campaign and evaluation tools, Olweus states that they "were completely different in terms of planning, data quality, times of measurement, and contact with the schools."[3(p39)]

Since the publication of the study by Olweus,[51] interventions targeting the whole school have been implemented in several other countries. Overall, these whole-school studies had positive effects on bullying. Of the additional 8 studies, 7 revealed positive outcomes.[25,37-40,42,43] Five of these studies[25,37,38,40,43] reported decreases in bullying or victimization. Among kindergarteners, Alsaker and Valkanover[25] found decreased victimization on teacher and student reports, although there was no significant change in bullying on either student nominations or teacher ratings. An Italian schoolwide peer support intervention prevented some of the increased negative behaviors and attitudes reported in the control group on student reports.[37] Examining administrative office records, Metzler et al[38] found decreased discipline referrals (P=.04) and harassment (P=.02) in select populations after 2 years of implementing a schoolwide behavioral management program. However, student reports of physical and verbal attacks did not significantly change. Twemlow et al[43] found decreased disciplinary referral rates, decreased suspension rates, and increased achievement test scores after a schoolwide intervention. In their evaluation of a 12-week schoolwide program, Rahey and Criag[40] found mixed results. On peer and self-reports, the students in grades 5 through 8 had decreased victimization (P<.05) and decreased peer isolation (P<.01) compared with the controls.[40] In contrast, the younger students reported increased levels of victimization (P<.05) and increased exclusion (P<.01).[40] In addition, neither student nor teacher reports showed a significant decrease in bullying for any age group.

Two of the studies[39,42] that revealed improvements after a multidisciplinary intervention only measured outcomes indirectly related to bullying. Some of the indirect outcomes were positively affected, but others remained unchanged. The evaluation by Sanchez et al[42] indicated no significant increase in knowledge of bullying, but the intervention students were more likely to report seeing bullying and to express readiness to intervene personally (P<.05 for both). A randomized controlled trial[39] evaluating an intervention to develop "health-promoting schools" re-

vealed an increased awareness of health-related policies and practices among school administrators after the intervention (P=.04). No significant changes in health-related policies or practices occurred in the intervention group, including those related to bullying.

The other evaluation of a whole-school intervention that we identified revealed no significant decreases in bullying. Melton et al[28] implemented an intervention based on the Olweus Bullying Prevention Program in 6 rural school districts in South Carolina. After 2 years, they found no significant differences in student self-reports of bullying, victimization, general antisocial behaviors, or attitudes toward bullying between the intervention and control students.

SOCIAL AND BEHAVIORAL SKILLS GROUP TRAINING INTERVENTIONS

Four studies[44-47] looked at targeted interventions involving social and behavioral skills groups for children involved in bullying. Two of these interventions specifically targeted children with high levels of aggression,[45,46] while the other 2 targeted children who were themselves victims.[44,47] Of the 4 studies, 3 focused on older students, in sixth through eighth grades,[45-47] while the fourth looked at third-grade students.[44] The most positive outcomes occurred for the youngest students.[44] DeRosier[44] tested the efficacy of social skills group training for third-grade students with peer relationship difficulties in 11 public primary schools in North Carolina. The intervention resulted in decreased aggression on peer reports (P<.001), decreased bullying on self-reports (P<.05), and fewer antisocial affiliations on self-reports (P<.05) for the previously aggressive children. This was the only social skills training intervention that showed clear reductions in bullying from the intervention.

The other social skills group interventions, all of which involved older children, did not result in clear changes. Meyer and Lesch[46] evaluated a behavioral skills modification program for boys identified as bullies in South Africa. This intervention did not produce any statistically significant decrease in bullying behaviors by peer report or self-report. Fast et al[45] examined whether group training in peer mediation for aggressive seventh graders would reduce their level of aggression. The aggressive students in the intervention group had a significant decrease in their problem behaviors as measured by their teachers (P<.05); however, no significant changes in disciplinary referrals for aggressive behavior or impulsivity scores occurred. Tierney and Dowd[47] used social skills group training for eighth-grade girls with emotional and behavioral concerns. Although the teacher data indicated statistically significant progress in the areas of friendships, behavior, interactions with peers, and level of teacher concern, the data and analysis were not given within the article. Data from the pupil questionnaires were not analyzed, but in student self-reports, 8 reported no difference in victimization and 7 reported improvement.

OTHER INTERVENTIONS

A single study, done by Bagley and Pritchard,[48] examined the effects of an increase in the number of school

social workers focused on problem behaviors, including bullying. Compared with matched control schools, they found a significant decrease in self-reported bullying within the primary school ($P<.05$), but worsening bullying in the secondary school. For self-reports of theft, truancy, fighting, and drug use, the primary and secondary intervention schools had significant improvements ($P<.05$). A study by King et al[49] investigated the effects of a mentoring program for "at-risk" children. The mentored students were significantly less likely than their nonmentored age-matched peers to report bullying ($P<.002$), physically fighting ($P<.001$), and feeling depressed ($P=.006$) in the past 30 days.

COMMENT

As governments, schools, and educators invest increasing amounts of money and time into antibullying interventions, the findings of this review provide evidence for how to best achieve the desired outcome of decreased bullying within schools. By systematically gathering and compiling the growing number of studies evaluating these interventions, it becomes clear that some of the antibullying interventions actually decrease bullying, while others have no effect or even seem to increase the amount of bullying. Grouping the studies by the type of intervention seems to offer the most insight into what leads to success.

The curriculum interventions were generally designed to promote an antibullying attitude within the classroom and to help children develop prosocial conflict resolution skills. Most of these interventions drew on the social cognitive principles of behavioral change,[52,53] with focus on changing students' attitudes, altering group norms, and increasing self-efficacy. Curriculum changes are often attractive because they usually require a smaller commitment of resources, personnel, and effort. Nevertheless, the interventions that consisted only of classroom-level curriculum seldom improved bullying. The basis in social, cognitive, behavioral change may explain part of the problem; previous work[54,55] suggests that younger children benefit less from these techniques. However, the failure of classroom-level interventions for older and younger students points to the systemic nature of bullying and supports the theory of bullying as a sociocultural phenomenon. If bullying is a systemic group process involving bullies, victims, peers, adults, parents, school environments, and home environments,[56] an intervention on only 1 level is unlikely to have a significant consistent impact. Furthermore, if bullying is, as some propose, a sociocultural phenomenon springing from the existence of specified social groups with different levels of power,[57] then curriculum aimed at altering the attitudes and behaviors of only a small subset of those groups is unlikely to have an effect.

Similarly, the targeted interventions providing training in social skills did not clearly improve bullying or victimization.[45-47] The failure of these interventions, also based largely on social, cognitive, behavioral changes, points again to the inability of a single-level intervention to combat bullying effectively. Interestingly, the older children had worse outcomes from the social skills training groups than the younger children.[44] The 1 study looking at younger children found decreased aggression, bullying, and antisocial affiliations. Although one cannot generalize from a single study, it is possible that addressing social skills changes in the context of a small targeted group during a particular developmental window could be effective. Overall, the studies of social skills group interventions suggest again that failing to address the systemic issues and social environment related to bullying undermines success.

The whole-school interventions, which included multiple disciplines and complementary components directed at different levels of the school organization, more often reduced victimization and bullying than the interventions that only included classroom-level curricula or social skills groups. The whole-school interventions address bullying as a systemic problem meriting a systemic solution. They seek to alter the school's entire environment and to involve individuals, peer groups, classrooms, teachers, and administration. The success of the whole-school interventions suggests that bullying does, indeed, spring from factors external to individual children's psychosocial problems, including a complex process of social interactions. An evaluation of whole-school approaches by Smith et al[56(p557)] in 2004 suggests that these interventions may "reflect a reasonable rate of return on the investment inherent in low-cost, nonstigmatizing primary prevention programs." Our review offers further support for using whole-school interventions to reduce or prevent bullying.

Despite the evidence pointing toward the value of whole-school approaches, significant barriers may still limit their effectiveness. The implementation of the intervention can vary significantly, and this clearly alters the results. The original antibullying whole-school approach studied in Bergen by Olweus[51] and the evaluation of the same program in Rogaland by Roland[27,41] produced the most strikingly disparate results. The contrast may have been the result of decreased school staff participation at the Rogaland schools.[27] In addition, the Olweus program does not include detailed instructions for replicating an identical program in another school setting. Difficulty in replicating this program may contribute to the lack of success when used in other settings, such as South Carolina.[28] Although the adaptation of the interventions in different settings may create more culturally appropriate interventions, these modifications may produce some of the variance in success. Unfortunately, the specific components of a given intervention are generally not described sufficiently to enable faithful replication. The specific school environment could also significantly impact effectiveness. The small class size, excellent teacher training, and tradition of social welfare intervention in some settings could enable better effects. The suggestion that whole-school interventions may not work as well for younger children, seen in 2 of the studies,[25,40] also merits consideration. This, albeit limited, evidence may support a developmental theory, whereby bullying begins in early childhood as individuals assert themselves to gain dominance and then gradually evolves as children use less socially reprehensible ways to dominate others.[58] Schoolwide rules and changes in

the school's overall responses to bullying may not be as effective in the younger population before they follow their natural developmental progression into conformity with social norms.

There are several limitations to this systematic review that warrant consideration. We only included studies in the English language. Although we may have, therefore, overlooked some relevant studies, we located few non–English-language studies that required exclusion. Some of the included studies did not have ideal methodological strength; however, many of the studies were reasonably well done and offered important counterbalances to the findings. The study results may be overestimated because, in many cases, schools or districts were randomized to treatment conditions, but the students were evaluated as the unit of analysis. The unit of analysis problem could result in a higher type I error if intraclass correlation is not taken into account.[59] Even so, many of the studies that did this still found no treatment effects. The use of variable outcome measures may further limit the ability to measure accurately the effects of these interventions. The most common outcome measures were self-reports of victimization and bullying that may not wholly correspond with information obtained from peers or teachers or from observations.[60] Still, self-reports are the standard measure used in most studies evaluating behavioral interventions. Despite the diversity of the evidence reviewed, the studies were primarily performed in Europe and the United States, which may limit the generalizability of the conclusions. In addition, several interventions with positive results, including interventions using mentoring, increased social workers by 2.5 workers, and social skills groups for younger children, were only studied on a single occasion, thus limiting their generalizability. Finally, while we attempted to separate out the most effective components or intervention strategies, many of the studies involved numerous complementary components that were not evaluated individually.

In conclusion, fairly consistent evidence suggests that children's bullying behavior can be significantly reduced by well-planned interventions. The chance of success is greater if the intervention incorporates a whole-school approach involving multiple disciplines and the whole school community. The school staff's commitment to implementing the intervention also may play a crucial role in its success. The use of curriculum or targeted social skills groups alone less often results in any decrease in bullying and sometimes worsens bullying and victimization. Caution should be exercised in supposing that antibullying interventions invariably produce the intended results. This review reveals that not all programs have proved effective. Most reductions in bullying tend to be relatively small and related more to the proportion of children being victimized rather than the proportion engaging in bullying. Additional research to evaluate bullying behaviors and antibullying interventions is clearly needed.

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REFERENCES

1. Glew G, Rivara F, Feudtner C. Bullying: children hurting children. *Pediatr Rev.* 2000;21:183-190.
2. Olweus D. Bullying at school: basic facts and an effective intervention programme. *Promot Educ.* 1994;1:27-31, 48.
3. Olweus D. Sweden; Norway. In: Smith PKMY, Junger-Tas J, Olweus D, Catalano R, Slee P, eds. *The Nature of School Bullying: A Cross-national Perspective.* New York, NY: Routledge; 1999:7-48.
4. Williams K, Chambers M, Logan S, Robinson D. Association of common health symptoms with bullying in primary school children. *BMJ.* 1996;313:17-19.
5. Rigby K. Peer victimisation at school and the health of secondary school students. *Br J Educ Psychol.* 1999;69(pt 1):95-104.
6. Dake JA, Price JH, Telljohann SK. The nature and extent of bullying at school. *J Sch Health.* 2003;73:173-180.
7. Kaltiala-Heino R, Rimpela M, Marttunen M, Rimpela A, Rantanen P. Bullying, depression, and suicidal ideation in Finnish adolescents: school survey. *BMJ.* 1999; 319:348-351.
8. Salmon G, James A, Smith DM. Bullying in schools: self reported anxiety, depression, and self esteem in secondary school children. *BMJ.* 1998;317:924-925.
9. Kaltiala-Heino R, Rimpela M, Rantanen P, Rimpela A. Bullying at school: an indicator of adolescents at risk for mental disorders. *J Adolesc.* 2000;23:661-674.
10. Olweus D. Victimization by peers: antecedents and long-term outcomes. In: Rubin K, Asendorf JB, eds. *Social Withdrawal, Inhibition, and Shyness in Children.* Hillsdale, NJ: Lawrence A Erlbaum Associates; 1993:315-341.
11. Brown SL, Birch DA, Kancherla V. Bullying perspectives: experiences, attitudes, and recommendations of 9- to 13-year-olds attending health education centers in the United States. *J Sch Health.* 2005;75:384-392.
12. Eisenberg ME, Neumark-Sztainer D, Perry CL. Peer harassment, school connectedness, and academic achievement. *J Sch Health.* 2003;73:311-316.
13. Hazler RJ, Hoover J, Oliver R. What children say about bullying. *Executive Educator.* 1992;14:20-22.
14. Kochenderfer BJ, Ladd GW. Peer victimization: cause or consequence of school maladjustment? *Child Dev.* 1996;67:1305-1317.
15. Mynard H, Joseph S. Bully/victim problems and their association with Eysenck's personality dimensions in 8 to 13 year-olds. *Br J Educ Psychol.* 1997;67:51-54.
16. Glew GM, Fan MY, Katon W, Rivara FP, Kernic MA. Bullying, psychosocial adjustment, and academic performance in elementary school. *Arch Pediatr Adolesc Med.* 2005;159:1026-1031.
17. Juvonen J, Nishina A, Graham S. Peer harassment, psychological adjustment, and school functioning in early adolescence. *J Educ Psychol.* 2000;92:349-359.
18. Nansel TR, Overpeck M, Pilla RS, Ruan WJ, Simons-Morton B, Scheidt P. Bullying behaviors among US youth: prevalence and association with psychosocial adjustment. *JAMA.* 2001;285:2094-2100.
19. Perry D, Kusel S, Perry L. Victims of peer aggression. *Dev Psychol.* 1988;24:807-814.
20. Smith PK, Ananiadou K, Cowie H. Interventions to reduce school bullying. *Can J Psychiatry.* 2003;48:591-599.
21. Olweus D. *Bullying at School: What We Know and What We Can Do.* Cambridge, Mass: Blackwell Publishers Ltd; 1993.
22. Olweus D. Bullying at school: basic facts and effects of a school based intervention program. *J Child Psychol Psychiatry.* 1994;35:1171-1190.

23. Stevens V, De Bourdeaudhuij I, Van Oost P. Bullying in Flemish schools: an evaluation of anti-bullying intervention in primary and secondary schools. *Br J Educ Psychol*. 2000;70:195-210.

24. Balk EM, Bonis PA, Moskowitz H, et al. Correlation of quality measures with estimates of treatment effect in meta-analyses of randomized controlled trials. *JAMA*. 2002;287:2973-2982.

25. Alsaker FD, Valkanover S. Early diagnosis and prevention of victimization in kindergarten. In: Juvonen J, Graham S eds. *Peer Harassment in School*. New York, NY: Guilford Press; 2001:175-195.

26. Cowie HS, Smith PK, Boulton M, Laver R. *Cooperation in the Multi-Ethnic Classroom*. London, England: David Fulton; 1994.

27. Roland E. Bullying: a developing tradition of research and management. In: Tattum DP, ed. *Understanding and Managing Bullying*. Oxford, England: Heinemann Educational; 1993:15-30.

28. Melton GB, Limber SP, Cunningham P, et al. *Violence Among Rural Youth*. Washington, DC: Office of Juvenile Justice and Delinquency Prevention; 1998.

29. Baldry AC, Farrington DP. Evaluation of an intervention program for the reduction of bullying and victimization in school. *Aggress Behav*. 2004;30:1-15.

30. Boulton MJ, Flemington I. The effects of a short video intervention on secondary school pupils' involvement in definitions of and attitudes towards bullying. *Sch Psychol Int*. 1996;17:331-345.

31. Elliott H, Faupel A. Children's solutions to bullying incidents. *Educ Psychol Pract*. 1997;13:21-28.

32. Englert D. *Investigating the Effectiveness of Violence Intervention in a Primary Education Setting: A Comparison of Programs* [dissertation]. University: University of Mississippi; 1999.

33. Kaiser-Ulrey C. *Bullying in Middle School: A Study of B.E.S.T.—Bullying Eliminated From Schools Together—An Anti-Bullying Program for Seventh Grade Students*. Tallahassee: Florida State University College of Education; 2003.

34. Rican P, Ondrova K, Svatos J. The effect of a short, intensive intervention upon bullying in four classes in a Czech town. *Ann N Y Acad Sci*. 1996;774:399-400.

35. Teglasi H, Rothman L. STORIES: a classroom-based program to reduce aggressive behavior. *J Sch Psychol*. 2001;39:71-94.

36. Warden D, Moran E, Gillies J, Mayes G, Macleod L. An evaluation of a children's safety training programme. *Educ Psychol*. 1997;17:433-449.

37. Menesini E, Codecasa E, Benelli B, Cowie H. Enhancing children's responsibility to take action against bullying: evaluation of a befriending intervention in Italian middle schools. *Aggress Behav*. 2003;29:1-14.

38. Metzler C, Biglan A, Rusby J, Sprague J. Evaluation of a comprehensive behavior management program to improve school-wide positive behavior support. *Educ Treat Child*. 2001;24:448-479.

39. Mitchell J, Palmer S, Booth M, Powell Davies G. A randomised trial of an intervention to develop health promoting schools in Australia: the south western Sydney study. *Aust N Z J Public Health*. 2000;24:242-246.

40. Rahey L, Criag W. Evaluation of an ecological program to reduce bullying in schools. *Can J Counseling*. 2002;36:281-296.

41. Roland E. Bullying in school: three national innovations in Norwegian schools in 15 years. *Aggress Behav*. 2000;26:135-143.

42. Sanchez E, Robertson T, Lewis C, Rosenbluth B, Bohman T, Casey D. Preventing bullying and sexual harassment in elementary schools: the Expect Respect model. In: Geffner R, Loring M, Young C, eds. *Bullying Behavior: Current Issues, Research, and Interventions*. Vol 2. New York, NY: Haworth Maltreatment & Trauma Press; 2001:157-180.

43. Twemlow SW, Fonagy P, Sacco FC, Gies ML, Evans R, Ewbank R. Creating a peaceful school learning environment: a controlled study of an elementary school intervention to reduce violence. *Am J Psychiatry*. 2001;158:808-810.

44. DeRosier ME. Building relationships and combating bullying: effectiveness of a school-based social skills group intervention. *J Clin Child Adolesc Psychol*. 2004; 33:196-201.

45. Fast J, Fanelli F, Salen L. How becoming mediators affects aggressive students. *Child Sch*. 2003;25:161-171.

46. Meyer N, Lesch E. An analysis of the limitations of a behavioral programme for bullying boys from a subeconomic environment. *S Afr J Child Adolesc Ment Health*. 2000;12:59-69.

47. Tierney T, Dowd R. The use of social skills groups to support girls with emotional difficulties in secondary schools. *Support Learning*. 2000;15:82-85.

48. Bagley C, Pritchard C. The reduction of problem behaviours and school exclusion in at-risk youth: an experimental study of school social work with cost-benefit analyses. *Child Fam Soc Work*. 1998;3:219-226.

49. King KA, Vidourek RA, Davis B, McClellan W. Increasing self-esteem and school connectedness through a multidimensional mentoring program. *J Sch Health*. 2002;72:294-299.

50. Olweus D. Victimization among schoolchildren: intervention and prevention. In: Albee G, Bond L, eds. *Improving Children's Lives: Global Perspectives on Prevention*. Thousand Oaks, Calif: Sage Publications; 1992:279-295.

51. Olweus D. Bullying among schoolchildren: intervention and prevention. In: Peters RD, McMahon RJ, Quinsey VL, eds. *Aggression and Violence Throughout the Life Span*. London, England: Sage Publications; 1992:100-125.

52. Conner M, Norman P. *Predicting Health Behaviour*. Buckingham, England: Open University Press; 1995.

53. Bennett P, Murphy S. *Psychology and Health Promotion*. Buckingham, England: Open University Press; 1997.

54. Winkel FW, Baldry AC. An application of the Scared Straight principle in early intervention programming: three studies on activating the other's perspective in pre-adolescents' perceptions of a stepping-stone behaviour. *Issues Criminological Leg Psychol*. 1997;26:3-15.

55. Baldry AC, Winkel FW. Early prevention of delinquency. In: Traverso GB, Bagnoli L, eds. *Psychology and Law in a Changing World*. London, England: Routledge; 2001:35-50.

56. Smith JD, Schneider BH, Smith PK, Ananiadou K. The effectiveness of whole-school antibullying programs: a synthesis of evaluation research. *School Psych Rev*. 2004;33:547-560.

57. Rigby K. Addressing bullying in schools: theory and practice. *Trends Issues Crime Criminal Justice*. 2003;259:1-6.

58. Hawley PH. The ontogenesis of social dominance: a strategy-based evolutionary perspective. *Dev Rev*. 1999;19:97-132.

59. Rooney BL, Murray DM. A meta-analysis of smoking prevention programs after adjustment for errors in the unit of analysis. *Health Educ Q*. 1996;23:48-64.

60. Pellegrini A, Bartini M. An empirical comparison of methods of sampling aggression and victimization in school settings. *J Educ Psychol*. 2000;92:360-366.