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The effectiveness of life skills- based school violence prevention programs in secondary education: a systematic review and meta- analysis

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ADMINISTRATIVE INFORMATION

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Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 29 May 2026 and was last updated on 29 May 2026.

INTRODUCTION

Review question / Objective The aim of this systematic review and meta-analysis is to synthesize existing evidence on the effectiveness of life skills-based violence prevention programs implemented in secondary school settings.

Rationale School violence is a major public health concern, with bullying alone affecting up to 50% of students worldwide and interpersonal violence ranked among the top five causes of mortality for adolescents. While evidence supports life skills programs at the preschool and elementary levels, significant gaps remain regarding effectiveness in secondary (middle and high school) settings where aggression peaks. This review addresses that gap by providing a comprehensive synthesis across a broad range of interventional study designs and outcome variables during adolescence.

Condition being studied School violence, encompassing physical aggression, relational

aggression, bullying (perpetration and victimization), dating/relationship violence, and general aggressive behavior among secondary school students (adolescents aged 12–18 years).

METHODS

Search strategy Studies were retrieved from 5 electronic databases (PubMed, Scopus, ERIC, CINAHL and PsycInfo). A systematic literature search was conducted using a combination of free-text and thesaurus/MeSH terms adapted for each database. Key free-text terms included: "school-based", "prevention", "program", "intervention", "violence", "aggression", "bullying", "life skills", "empathy", "self-awareness", "emotional regulation", "conflict resolution", "social emotional learning", "communication skills", "resilience", "anger management", "secondary education", "adolescent", "teenager", "high school", "effectiveness", "impact", and "outcome". Only peer-reviewed studies in English, published 2005–2025 were retrieved.

Boolean operators AND/OR were used to combine terms across concept blocks (population, intervention, outcomes).

Participant or population Adolescents aged 12 to 18 years, or students enrolled in secondary education (middle school or high school). Studies reporting a mean age of participants within this range are also eligible.

Intervention School-based violence prevention programs delivered through life skills training as a key intervention component. Eligible programs explicitly aimed to develop adolescents, life skills (e.g., emotional regulation, empathy, communication, problem-solving, conflict resolution, decision-making, self-regulation) with the goal of reducing school violence or aggression. Programs were implemented within the school setting, either during regular activities or as dedicated prevention initiatives.

Comparator Pre-intervention baseline (pre-test/post-test design within the same group) or control/comparison groups in quasi-experimental or randomized controlled trial designs receiving no intervention.

Study designs to be included Interventional studies only, including: Randomized Controlled Trials and Quasi-experimental designs with control groups or without (pre/post-test design), aiming to reduce violence or general aggression among secondary education students. Only studies where the intervention was carried out within the school environment were considered eligible.

Eligibility criteria **INCLUSION:** (1) Interventional studies assessing effectiveness of school-based violence prevention programs with life skills as a key component; (2) Outcomes related to school violence: aggressive behavior, bullying perpetration/victimization, dating/relationship violence; (3) Participants aged 12–18 years or secondary school students (mean age within range); (4) Interventions carried out within the school setting; (5) Studies published in English or Greek between January 2005 and May 2025. **EXCLUSION:** (1) Case reports, books, encyclopaedias, news, short communications, reviews, and observational studies; (2) Studies without specified participant age or outside 12–18 age range; (3) Studies using questionnaires not directly assessing program effectiveness; (4) Studies where parents completed questionnaires on behalf of children; (5) Studies focused primarily on high-risk behaviors outside school (alcohol/drug use, HIV, sexual health) without measurable

violence outcomes; (6) Studies focused solely on cyberbullying without assessing in-school violence.

Information sources Eligible studies were retrieved from 5 electronic databases: PubMed, Scopus, ERIC, CINAHL and PsycInfo.

Main outcome(s) Effectiveness in reducing violent and aggressive behaviors including Physical aggression (perpetration and victimization), Bullying perpetration and victimization, Dating/relationship violence (perpetration and victimization), General school violence and antisocial behavior and Negative conflict resolution strategies.

Data management All retrieved records were imported into Zotero reference manager for deduplication (118 duplicates removed automatically; 4 manually). Screening was conducted independently by 2 researchers in a two-step process: (1) title and abstract screening, (2) full-text screening. Descriptive data were extracted in standardized spreadsheet format, including author name, year, country, study design, sample size, age, outcome variables, and statistical outcomes. Statistical outcomes were standardized to Hedges' g using established conversion formulas.

Quality assessment / Risk of bias analysis Randomized trials: Cochrane revised RoB2 tool, which evaluates 5 domains: randomization, deviations from intended intervention, missing data, outcome measurement, selective reporting. Non-randomized interventions: Cochrane revised ROBINS-I V2 tool, which evaluates 6 domains: confounding, classification of intervention, selection bias, missing data, outcome measurement, selective reporting.

Strategy of data synthesis A three-level random-effects meta-analytic model was employed using the metafor package in R to account for dependency of multiple effect sizes nested within the same study. Variance was decomposed into between-study (Level 3) and within-study (Level 2) heterogeneity. Robust Variance Estimation using the CR2 sandwich estimator (clubSandwich package) was applied on top of the three-level model. All effect sizes were expressed as Hedges' g. Heterogeneity was assessed using Cochran's Q-test and variance decomposition. Publication bias was assessed using an Egger-style multilevel regression test.

Subgroup analysis A subgroup/moderation analysis was conducted for outcome type as a

categorical moderator (bullying perpetration, bullying victimization, dating violence perpetration, dating violence victimization, hostility, misconduct, nonphysical aggression, physical aggression).

Sensitivity analysis Leave-one-out sensitivity analysis was conducted, where each study was sequentially removed and the three-level model was re-estimated to assess robustness of the pooled effect.

Country(ies) involved Greece - University of West Attica.

Keywords school violence, life skills, adolescence, prevention, secondary education.

Contributions of each author

Author 1 - KONSTANTINA TRIMMI - Conceived the study, conducted the literature search, screened the studies, extracted and analyzed the data, performed the meta-analysis, and drafted the manuscript.

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