Enhancing the Emotional and Social Skills of the Youth to Promote their Wellbeing and Positive Development: A Systematic Review of Universal School-based Randomized Controlled Trials

Federica Sancassiani[1,*], Elisa Pintus[1], Arne Holte[2], Peter Paulus[3], Maria Francesca Moro[1], Giulia Cossu[1], Matthias C Angermeyer[1], Mauro Giovanni Carta[1] and Jutta Lindert[4]

[1]*Department of Public Health, Clinical and Molecular Medicine, University of Cagliari, Italy;* [2]*Norwegian Institute of Public Health, Oslo, Norway;* [3]*Institute of Psychologie & Center for Applied Sciences of Health, Leuphana University Lueneburg, Germany;* [4]*University of Applied Sciences Emden, Emden, Germany; Brandeis University, Waltham, USA*

Abstract: *Background*: The acquisition of social and emotional skills is associated with positive youth development, character education, healthy lifestyle behaviours, reduction in depression and anxiety, conduct disorders, violence, bullying, conflict, and anger. School-based interventions aimed to enhance these skills go beyond a problem-focused approach to embrace a more positive view of health; they could also improve the youth's wellbeing. *Aim*: To describe the main features and to establish the effectiveness of universal school-based RCTs for children and the youth, aimed to promote their psychosocial wellbeing, positive development, healthy lifestyle behaviours and/or academic performance by improving their emotional and social skills. *Methods*: Systematic review by searching for relevant papers in PubMed/Medline with the following key words: "mental health" OR "wellbeing" OR "health promotion" OR "emotional learning" OR "social learning" OR "emotional and social learning" OR "positive youth development" OR "life skills" OR "life skills training" AND "school". Interval was set from January 2000 to April 2014. *Results*: 1,984 papers were identified through the search. Out of them 22 RCTs were included. While most interventions were characterized by a whole-school approach and SAFE practices, few studies only used standardized measures to assess outcomes, or had collected follow-up data after ≥ 6 months. The results of all these trials were examined and discussed. *Conclusion*: Universal school-based RCTs to enhance emotional and social skills showed controversial findings, due to some methodological issues mainly. Nevertheless they show promising outcomes that are relatively far-reaching for children and youth wellbeing and therefore are important in the real world.

Keywords: Children wellbeing, emotional skills, health promotion, positive development, randomised controlled trials, school, social skills.

BACKGROUND

The WHO [1] defines mental health as "a state of wellbeing in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community". Wellbeing itself is one of the aims of the WHO strategy "Health 2020", which states that mental health promotion involves building peoples' resilience against various stressors in their lives [1-6]. Resilience is defined as the universal capacity that allows a person, group or community to respond proactively to new situations and to prevent, minimize or overcome the damaging effects of adversities [1, 2, 7].

Research shows that mental health promotion is most effective when it takes place early in a persons' life: therefore school is a favourable implementation setting for these programmes [1-4, 8-10]. The WHO [4] states that "there is ample evidence that school based programs in elementary,

middle and high schools can positively influence mental health and reduce risk factors, emotional and behavioural problems through socio-emotional learning and ecological interventions".

Furthermore, recent evidences about school-based interventions promoting mental health and wellbeing point out the need to go beyond a problem-focused approach and embrace a more positive view of mental health [9, 11-16]. This shift involves the acknowledgment that childrens' and youths' wellbeing and mental health are not only influenced by the absence of problems and risk-need concerns, but are also impacted by individual skills and by those positive factors in their social settings that contribute to positive growth and development [10, 12].

From this perspective, extensive research in school, community, and clinical settings has led several authors to offer recommendations for effective school-based interventions on emotional and social skills to promote positive youth development, mental health and wellbeing [9, 12, 17, 18]. These interventions include a whole school approach, in which multi-component interventions involve students, teachers, the school environment and the community by par-

*Address correspondence to this author at the Centro di Psichiatria di Consultazione e Psicosomatica, University Hospital, Cagliari, Italy;
Tel: +39/070/6093495; E-mail: federicasancassiani@yahoo.it

ticipatory ways whereby everyone, driven by common purposes, can give their own contribution from different points of view and roles, with continuous implementation for more than one year [18-20]. Furthermore, research shows four recommended practices – Sequenced, Active, Focused, Explicit - to implement good programs under the acronym SAFE [9]. The programs could be effective if they use a sequenced step-by-step training approach (Sequenced), active forms of learning (Active), devote sufficient time to skill development (Focused), and have explicit learning goals (Explicit) [21-24].

These complex features show that contemporary schools are expected to do more, but often with poorer resources than they used to have in the past [18]. A comprehensive mission for schools is not only to reach good academic achievements and knowledge, but also to promote personal and social responsibility, health, caring and citizenship and positive development for all students [18].

Positive youth development includes ecological, asset or strength-based approaches that promote healthy growth through supportive community environments and good relationships [25, 26]. The focus is on building relationships with caring adults that support engagement in challenging activities in which the youth are active participants, rather than solely the recipients of services or support [25-28].

Catalano *et al.* [12] identified a set of recognizable features of positive youth development programs, some school-based too, which seek to achieve one or more of the following objectives: promote bonding, social, emotional, cognitive, behavioral, and moral competence; foster resilience, self-determination, spirituality, self-efficacy, clear and positive identity, belief in the future, prosocial norms (healthy standards for behavior); provide recognition of positive behavior and opportunities for prosocial involvement.

Furthermore, the WHO [8] defines *life skills* as "abilities for adaptive and positive behavior, that enable individuals to deal effectively with the demand and challenges of every day life". The nature and the definition of life skills are likely to differ across cultures and settings, but there is a core set of skills, as defined by the WHO [8]: decision making, problem solving, creative thinking, critical thinking, effective communication, interpersonal relationship skills, self-awareness, empathy, coping with emotions, and coping with stress.

Recent reviews have noted that certain psychosocial and developmental prevention programs such as the Life Skills Training (LST) [29-31] can be effective in preventing early-stage drug use (tobacco, alcohol, marijuana), alcohol misuse and risky sexual behaviours. LST is focused on teaching social resistance skills or a set of general life skills, either alone or in combination, and it can produce durable prevention effects [29, 32-34].

Furthermore in the 1990s', the Fetzer Insitute first introduced the term *Social and Emotional Learning* (SEL) to identify those interventions that can integrate the promotion of personal skills to reduce risk factors and enhance protective factors for positive youth development [12, 18, 35-38]. SEL is the process of acquiring core competencies to recognize and manage emotions, set and achieve positive goals,

appreciate the perspectives of others, establish and maintain positive relationships, make responsible decisions, and handle interpersonal situations constructively [35]. SEL programs are focused on the development of a whole set of cognitive, affective, and behavioural competencies: self-awareness, self-management, social awareness, relationship skills, and responsible decision making [39]. These skills mediate better academic performance, healthy behaviours, positive social behaviours, fewer conduct problems, less emotional distress, and citizenship [18, 40, 41].

AIM

This systematic review was carried out to describe the main features and to establish the effectiveness of universal school-based RCTs for children and the young aged 0-17 years old, aimed to promote their psychosocial wellbeing, positive development, healthy lifestyle behaviors and/or academic performance by improving their emotional and social skills.

METHOD

Identification of the Studies

The search of the significant articles was carried out in PubMed/Medline with the following key words: "mental health" OR "wellbeing" OR "health promotion" OR "emotional learning" OR "social learning" OR "emotional and social learning" OR "positive youth development" OR "life skills" OR "life skills training" AND "school".

Inclusion Criteria

The studies included in this review were randomized controlled trials, in which universal school-based interventions on students' emotional and social skills to promote their wellbeing were compared to similar interventions, interventions as usual or no intervention, with samples of students aged 0-17 years old.

Interval was set from January 2000 to April 2014.

Exclusion Criteria

Any study other than randomized controlled trials, and multiple publications on the same cohorts, studies with data analysis still pending, those conducted on indicated populations of students (i.e. at risk for some psychiatric disorder, or with low income, or belonging to ethnic minorities) and those not written in English were excluded.

The process of inclusion/exclusion of studies is summarized in Fig. (**1**) by Prisma Flow Diagram.

Multiple Publications on the Same Cohorts

Multiple interventions from the same report were analyzed separately if the data related to distinct outcomes or contained separate cohorts. For multiple publications evaluating the same intervention but containing different outcome data at the post-hoc or follow-up analysis for the same cohort, only the data on the last published paper were reported with reference to the others (see Tables).
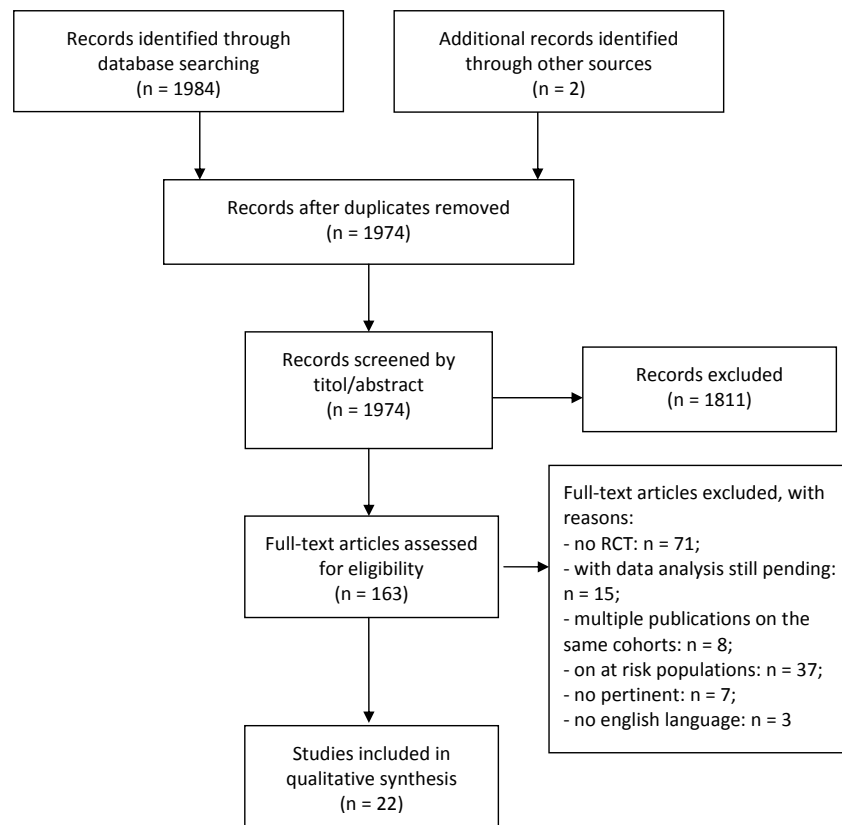
Fig. (1). Prisma flow diagram about studies' inclusion process.

Studies Not Assessing Emotional or Social Skills as Mediators

The papers on the interventions focused on outcomes related to physical health or unhealthy behaviors only (i.e. substance abuse), without assessment of those psychological or social health variables considered as mediators by the authors, were included and summarised in dedicated tables.

Content and Thematic Analysis

Data were extracted from the included papers and organized in tables using four main criteria.

The first criterion was the kind of the implemented interventions (Life Skills Training; Life Skills Training programs focused on behavioural outcomes only; Miscellany of programs targeting psychological and social skills).

The second was the study content: Country of implementation, year of publication, students' grade, controls, sample size, whole school approach level of the intervention, duration and assessment timeline.

The third was the results: outcomes and mediators considered by the authors, measures and tools used.

The last criterion regarded the quality features of the studies (using standardised outcome measures; including ≥ 6 months follow-up assessment after the conclusion of the intervention or waves of data across 2 academic years at least); effectiveness ($p < 0.05$); fitting characteristics of SAFE practices (Sequenced; Active; Focused; Explicit); fitting levels of whole school approach (students; teachers; parents; school

environment; community). These features were coded dichotomously (yes/no).

Outcomes

We considered the main and/or secondary outcomes, as well as the mediators, as declared by the authors.

RESULTS

Characteristics

The search included 22 RCTs involving 49,169 students aged 6-18 (5-12 school grades).

Out of these, 12 (54%) studies were conducted in USA [32, 42-44 (study 1 and 2), 45, 55-60], 3 (14%) in Europe [20, 46, 47] and 7 (32%) in other countries (Australia, Canada, Mexico, South Africa, Hong Kong, Taiwan, Thailand) [48-54].

Regarding the educational level of the students participating in the studies, 1 (4.5%) study involved 2nd grade students [47] 1 (4.5%) involved 3rd grade students [55], 2 (9%) involved 5th grade students [43, 46], 4 (18.2%) involved 6th grade students [42, 44 (study 1 and 2), 54], 4 (18.2%) involved 7th grade students [32, 48, 56, 57], 2 (9%) involved 8th grade students [49, 52]; 1 (4.5%) involved 9th grade students [58]; 1 (4.5%) study involved 5-8 grades students [53], 1 (4.5%) study involved 7-12 grades students [50], 1 (4.5%) study involved 9-11 grades students [59], 1 (4.5%) study involved 10-12 grades students [51], 2 (9%) studies involved 11-12 grades students [45, 60].

Table 1a. "Life Skills Training" (LST) programs measuring both emotional and social skills, and healthy behavior outcomes.

Study	Country	Interventions (Focus; Sample Size)	Controls (Focus; Sample Size)	Students' Population Size	Students' Age/Grade at Baseline	Duration and Assessment Timeline
Buhler *et al.,* [46]	Germany	*"General Life Competencies and Skills" - Life Skills Training* (program to to promote life skills and prevent substances use; N= 256)	*Treatment as usual* (Not defined; N=192)	N=448	5 grade	1 academic year (pre-post)
Eisen *et al.,* [42] - see also: Eisen *et al.,* [68]	USA	*Lions–Quest Skills for Adolescents (SFA)* (life skills training' program to promote life skills and prevent drug use; N=not reported)	*Standard care* (Not defined; N=not reported)	N= 7426	6 grade	1 academic year (40 key sessions) (baseline at the and of year 6 and post-treatment at the end of year 7) (pre-post).
Fitzpatrick *et al.,* [20]	Ireland	*Working Things Out - Social, Personal and Health Education Programme (SPHP) - Enhanced (EP)* (life skills training' program plus mental health promotion component to promote life skills, shool ethos and prevent emotional and behavioural difficulties; N= 527	*Social, Personal and Health Education Programme (SPHP) – Standard (SP)* (life skills training' program; N=545	N=1072	7-11 grades	8 months (pre-post + 6 months follow-up)
Huang *et al.,* [48]	Taiwan	*Life Skills Training* (program based on Theaory of Planned Behavior (TPB) to promote life skills and prevent drugs use; N= 143)	- *Conventional* (conventional didactic teaching about the harmful effects of using illicit drugs and drugs refusal skills for two 45-minutes sessions; N=142) - *No intervention* (N=156)	N=441	7 grade	16 weeks + 8-10 weeks homeworks (pre-post)
Johnson *et al.,* [43]	USA	*Think Smart – Life Skills Training* (program to promote life skills and prevent use of harmfull legal products (HLP); N= 630)	*No intervention* (N= 586)	N=1216	5 grade	12 weeks (core sessions) + 3 weeks after 2-3 months from core sessions (booster sessions) (wave 1 – baseline: prior to the start of core sessions; wave 2 – post-treatment: after the end of booster sessions; wave 3: 6 months follow-up)
Resnicow *et al.,* [49]	South Africa	- *Life Skills Training* (life skills training' program to promote life skills and prevent drug use; N=1717) - *KEEP LEFT* (Harm minimization program to prevent substance use; N=1978)	*Usual tobacco and substance use education* (N=1571)	N = 5266	8 grade (baseline)	2 academic years (8 units for each of grade 8 and 9) (pre-1 post at the end of grade 8-1 post test al the end of grade 9)
Seal, [50]	Thailand	*Life Skills Training* (program to promote life skills and prevent tobacco and drug use; N=85)	*Treatment as usual* (*Tobacco and drug education curriculum normally provided;* N=85)	N=170	7-12 grades	10 class period (≈60 min each or 10 class hours of content) (pre-post after 6 months)
Walker *et al.,* [51]	Mexico	- *Life Skills Training (*programe to promote life skills, condome use and HIV knowledge; N = not reported) - *Life Skills Training + module on emergency contraception* (programe to promote life skills, condome use, HIV knowledge and emergency contraception; n = not reported)	*Biology based sex education course* (N = not reported)	N= 10.954	10-12 grades	1 academic year (15 week, 30 hour course (16 weeks, 32 hours for the promotion with contraception arm) (pre-post + 16 months follow-up)

Table 1b. "Life Skills Training" (LST) programs measuring only healthy behavior outcomes.

Study	Country	Interventions (Focus; Sample Size)	Controls (Focus; Sample Size)	Students' Population Size	Students' Age/Grade at Baseline	Duration and Assessment Timeline
Botvin *et al.,* [32]	USA	*Life Skills Training* (program to promote life skills and prevent drug use; N=302)	*Treatment as usual* (Not defined; N=145)	N=447	7 gade	3 academic years (intervention in the first academic year + booster in second and third academic years) (pre-post)
Spoth *et al.,* [56] - see also: Spoth *et al.,* [69; 70]	USA	- *Iowa Strenghtening Families Program (ISFP)* (ISFP ia a program to enhance parental skills in nurturing, limit setting, and communication, as well as youth prosocial and peer resistance skills to reduce youth substance use and other problems behaviors; N = 148) - *Preparing for the Drugs Free Years(PDFY)* (Family competency training program to enhance protective parent-child interactions and to reduce childrens' risk for early substance use initiation; N = 140)	*Minimal contact (*mailed reading materials; N = 156)	N = 444	6 grade (base-line)	1 academic year (ISFP duration was 7 sessions (each 2 hours); PDFY duration was 5 sessions (each 2 hours)) (pre + 6.5 years past baseline (follow-up)
Spoth *et al.,* study 1 [44]	USA	- *Life Skills Training (LST) + Strenghtening Families Program for parents and youth 10-14 (SFP 10-14)* (LST ia a program to promote skills development and to provide knowledge to avoid substance use; SFP 10-14 ia a program to enhance parental skills in nurturing, limit setting , and communication, as well as youth prosocial and peer resistance skills to reduce youth substance use and other problems behaviors; N = 189); - *Life Skills Training (LST) only* ; N = 208)	*Minimal contact (*mailed reading materials; N = 196)	N = 593	6 grade (base-line)	2 academic years ((LST duration was 15 session in 7 grade + 5 booster sessions taugh 1 year later; SFP 10-14 duration was 7 con-secutive weeks when youth were in 7 grade + 4 booster session taugh 1 year later) (pre + 4.5 years past baseline (1 follow-up) + 5.5 years past baseline (2 follow-up)
Spoth *et al.,* study 2 [44]	USA	- *Life Skills Training (LST) + Strenghtening Families Program for parents and youth 10-14 (SFP 10-14)* (LST ia a program to promote skills development and to provide knowledge to avoid substance use; SFP 10-14 ia a program to enhance parental skills in nurturing, limit setting , and communication, as well as youth prosocial and peer resistance skills to reduce youth substance use and other problems behaviors; N = 543); - *Life Skills Training (LST) only* ; N = 622)	*Minimal contact (*mailed reading materials; N = 489)	N = 1677	7 grade (base-line)	2 academic years (LST duration was 15 session in 7 grade + 5 booster sessions in 8 grade; SFP 10-14 duration was 7 consecutive weeks when youth were in 7 grade + 4 booster session while youth were in 8 rade) (pre + 5 repeted measures during 8-12 grade (post and follow-up)
Young *et al.,* [58]	USA	- *Life Skills Training + standard physical education* (program to enhance decision making about the personal benefits of a physically active lifestyle, develop problem-solving skills, and obtain support from others + school- standard physical education; N = 116)	- School physical educa-tion (Standard physical education curriculum in which students were taught skills in individual and team sports; N =.105)	N = 221	9 grader	1 academic year (pre-post)

Table 1c. Different programs (than LST) on emotional and social skills, psychological wellbeing indicators, healthy behaviors, academic performance outcomes.

Study	Country	Interventions (Focus; Sample Size)	Controls (Focus; Sample Size)	Students' Population Size	Students' Age/Grade at Baseline	Duration and Assessment Timeline
Bond *et al.,* [52]	Australia	*Gatehouse Project* (program on emotional wellbeing promotion to prevent substances use; baseline: N=1335)	*No intervention* (N=1343)	N= 2678	8 grade	3 academic years (4 waves of students: baseline at the beginning of year 8; other assessments: at the and of year 8, 9, 10 (pre-post)
He *et al.,* [53]	Canada	*Free Fruit and Vegetable Snacks (FFVS) plus Enhanced Nutrition Education (ENE)* (program offering either one fruit or one vegetable serving three time per week plus "Paint Your Plate! Create a Master Piece: Vegetables and Fruit Action Guide for Schools", a curriculum-based resources for teachers to enhance students' awareness, knowledge, self-efficacy, preference, intention and willingness to increase fruit and vegetable consumption; N=3104)	*- Free Fruit and Vegetable Snacks (FFVS)* (program offering either one fruit or one vegetable serving three time per week; N=1625) *- No intervention* (N=1659)	N=6388	5-8 grades	21 weeks (pre-post)
Holen *et al.,* [47]	Norway	*Zippis' Friends* (program to strenght childrens' coping skills; N=686)	*No intervention* (N = 638)	N = 1324	2 grade	24 weeks (pre-post)
Jones *et al.,* [55]	USA	*4Rs Social-Emotional Learning Program (Reading, wRiting, Respect and Resolution)* (program to prevent social-emotional, behavioral and academic problems; N=630)	*No intervention* (N=554)	N=1184	3 grade	2 academic years (wave 1 – baseline, fall third grade; wave 2 – spring third grade; wave 3 – fall fourth grade; wave 4 – spring fourth grade)
Khalsha *et al.,* [57]	USA	*Yoga Ed Program* (program to increase psychosocial wellbeing and mental health; N= 74)	*Regular physical education* (Not defined; N= 47)	N=121	7 grade	11 weeks (pre-post)
Melnik *et al.,* [59]	USA	*COPE (Creating Oppurtunities for Personal Empowerment) Healthy Lifestyles TEEN (Thinking, Emotions, Exercise, Nutrition) Program* (cognitive-behavioral skills-building intervention with 20 minutes of physical activity integrated into a health course to promote healthy lifestyles behaviors, good MBI, good psychosocial outcomes, social skills, and academic performance; N=358)	*Attention program (Healthy Teen)* (manualized attenction program focused on safety and common health topic/issue for teens. Control students received also a manual with homeworks and reviewed with their parents a newsletter sent to their homes; N=421)	N=779	9-11 grades	15 weeks (pre-post + 6 months follow up)
Noogle *et al.,* [60]	USA	*Kripalu Yoga* (program to increase psychosocial wellbeing and self-regulatory skills; N=36)	*Regular physical education* (Not defined; N=15)	N=51	11-12 grades	10 weeks (pre-post)
Shek *et al.* [54] - see also: Shek *et al.,*; [71; 72; 73; 74; 75; 76]	Hong Kong	*PATHS (Positive Adolescent Training through Holistic Social Programmes)* (programme to promote positive development and reduce risks/problem behaviors; N=2662)	*No intervention* (N=3272)	N=5934	6 grade (baseline)	3 academic years (400 hours in each school year for each grade) (8 year waves: pre- 5 measures + 2 post interventions)

(Table 1c.) contd….

Study	Country	Interventions (Focus; Sample Size)	Controls (Focus; Sample Size)	Students' Population Size	Students' Age/Grade at Baseline	Duration and Assessment Timeline
Werch *et al.,* [45]	USA	3 interventions based on Behavioral-Image Model (BIM) (brief interventions based on printed text and scripted messages which attempted to elicit an image of successful young adults and to show the benefits of being successful in terms of enhanced self-image): - *Plan for Success Goal clarification Survey (Goal Survey)* (self administered instrument to identify behaviors that would improve their future chances of being successful, as well as those that would interfere, along with improvements in the way they would view themselves or others might see them resulting from becoming a more successful young adult; N = 113); - *Goal Survey plus a Path to Success Goal Plan (Contract)* (The Contract was designed to assist participants in selecting self-concordant goals they felt lead to a more successful and happy life, which have been found to facilitate behavioral change; N = 113); - *Goal Survey plus a Career Consultation (Consult)* (The Consult was designed to provide image-based feedback tailored to targeted personal development and health behaviors; N = 109)		N = 335	11-12 grades	1 academic year (max 20-minute sessions during regular school hours; pre and 1 month post)

19 studies were published in 2006-2014 (86%) [20, 43, 44 (study 1 and 2), 45-51, 53-60]; 3 (14%) studies were published in 2000-2005 [32, 42, 52].

Kind of the Interventions Implemented

Life Skills Training (LST) was the kind of intervention tested in 13 (59%) trials [20, 32, 42-44, 46, 48-51, 56, 58]. Among them, 5 (38.5%) were conducted by testing effectiveness of LST on healthy behaviours without assessing social and psychological skills as secondary outcomes or mediators [32, 44 (study 1 and 2), 56, 58].

Regarding the studies measuring the efficacy of Life Skills Training (LST) on both social and emotional skills, and healthy behaviours, 6 (75%) of them took into account both kinds of outcomes [42, 43, 46, 49-51]; 2 (25%) trials considered social and emotional skills only [20, 48].

Finally, 9 (41%) trials had miscellanea of different programs on students' wellbeing outcomes (emotional and social skills, healthy lifestyle behaviors, academic performance, psychological wellbeing) [45, 47, 52-55, 57, 59, 60].

Quality Features of the Studies

Regarding the use of standardized outcome measures, 10 (45%) trials were conducted with standardized tools [32, 42, 45, 47, 53, 54, 55, 57, 59, 60]. 3 (14%) studies used both standardized and not-standardized measures [20, 52, 58].

Finally, 9 (41%) studies were not conducted by standardized tools [43, 44 (study 1 and 2), 46, 48-51, 56].

Regarding the assessment timeline, 9 (41%) studies included a ≥ 6 month follow-up after the end of the intervention [20, 43, 44 (study 1 and 2), 50, 51, 54, 56, 59]. Among them, 4 (18% of 22) included also at least two academic years of repeated measures (data waves) [44 (study 1 and 2), 54, 56]. Only 2 (9%) studies reported at least two academic years of repeated measures (data waves) design without a ≥ 6 month follow-up after the end of the intervention [52, 55]. Finally, 11 (50%) studies reported neither a ≥ 6 month follow-up after the end of the intervention, nor a minimum of two academic years of repeated measures (data waves) [32, 42, 45-49, 53, 57, 58, 60].

Regarding SAFE (Sequenced, Active, Focused, Explicit) practices, in all of 22 (100%) trials at least three of these practices were used.

The whole school approach levels were the same in 12 (54.5%) studies, which means that the interventions involved students, their teachers and the school environment but not their parents and community [32, 42-44 (study 2), 46-49, 51, 52, 55, 56]. In 2 (9%) studies, interventions involved students, their teachers, the school environment and the community but not their parents [20, 53]. 2 (9%) studies focused on interventions that involved only students, without the engagement of their parents and teachers, the school environment and the community [50, 57]. 4 (18.2%) trials

Table 2a. Outcomes and tools: "Life Skills Training" (LST) programs measuring emotional and social skills and/or healthy behavior outcomes.

Study	Outcomes	Mediators or Covariates	Measures/Tools
Buhler *et al.,* [46]	Healthy behaviors: - tobacco and alcohol' use - affinity toward tobacco and alcohol Emotional and social skills: - Knowledge about life skills and life skills behaviors (self-awareness and empathy, creative and critical thinking, communication and interpersonal relationships, decision making and problem solving and coping with stress and emotions + refusal assertiveness).		not standardized scales: - respondents were asked whether they had ever used tobacco or alcohol (response format: 'yes, several times', 'yes, I tried' and 'no') and whether they had used it in the past 30 days. Current users reported frequency of use during the past 30 days and amount of use per occasion. The amount of alcohol use per occasion was reported in a free format. Subsequently, data were dichotomized into 'abuse' and 'no use/experimental use'. - "Tobacco and Alcohol Distance" are two scales developed to predict later substance use behavior (not standardized). - "Life Skills Behaviors": 33 items scale + 3 items taken from Botvins' questionnaire indicating refusal assertiveness (developed by authors)
Eisen *et al.,* [42] - see also: Eisen *et al.,* [68]	Healthy behaviors: - tobacco, alcohol and illega/illicitl drugs use Emotional and social skills: - behavioral intention to use tobacco, alcohol, marijuana and cocaine in the next 3 months - social influences - interpersonal perceptions - perception of harmful effects of drugs - communication skills - self efficacy - sensation-seeking	- sociodemographics (gender, age, family structure/household composition, race/ethnicity)	- 3 cigarette smoking questions established by the National Cancer Institute as standard items standard questions adapted from Monitoring the Future (MTF) study for alcohol, marijuana, cocaine and other illegal/illicit drugs use: - item from (MTF) for behavioral intention to use - standard questions on normative beliefs about the prevalence of substance use by a best friend, friend in general and same grade-peer - 3 items scale on whether using alcohol, cigarettes and marijuana make it easier to "fit in". - 3 items scales focusing on wheather alcohol/being drinking, smoking/marijuana, cocaine help or harm ones' health, ability to relax, and popularity - 3 items scales to assess self efficacy around refusing the use of alcohol, cicarettes/marijuana, cocain in various situations - 2 items scale for perceived parent monitoring of students' behaviors - demographic variables scale
Fitzpatrick *et al.,* [20]	Emotional and social skills: - prosocial behaviour - emotional and behavioural difficulties - active coping, support seeking and less use of avoidance - help-seeking - students' views of school social environment	- Sociodemographics (gender) - Cut off scores of mental problems (Clinical/Normal)	- The strengths and difficulties questionnaire (SDQ) - The childrens' coping strategies checklist (CCSC) - help-seeking questionnaire (not standardized) - 'What is your school like?' questionnaire (not standardized)
Huang *et al.,* [48]	Emotional and social skills: - Theory of Planned Behaviors' constructs: (intention not to use illicit drugs; attitude, subjective norm, perceived behavioral control); - life skills		- questionnaire for Theory of Planned Behaviors' constructs (not standardized) - 16 items questionnaire for life skills (not standardized)
Johnson *et al.,* [43]	Healthy behaviors: - Harmfull Legal Products (HLP) use (inhalants, prescription medicines, over-the-counter medications, common household products) - substance use (tobacco, alcohol, marijuana or hashish Emotional and social skills: - Risk factors (Peer Use of HLPs; Peer Normative Beliefs about HLPs); - Protective factors (Knowledge of Drugs and	- Community/School-Level Characteristics (community population (2006), percentage of White population in the community, poverty rate, average experience level of teachers, number of vandalism incidents, number of enrolled students, number of suspensions and expulsions (across nine possible types), number of school incidents (across nine possible types), rate of in-migration, rate of out-migration, proportion of students eligible for free or reduced-price lunch, and school	- questionnaire for tobacco, alcohol, marijuana, inhalants, prescription medicines, and over-the-counter medications use (taken from Arthur *et al.,* 1998, not standatized); - questionnaire for common household products' use (not standardized); - 4 items for Peer Use of HLPs (modified from Hansen and McNeal, 1997, not standardized); - 4 items for Peer Normative Beliefs about HLPs (modified from Hansen and McNeal, 1997, not standardized);

Study	Outcomes	Mediators or Covariates	Measures/Tools
	Consequences of Use; Assertiveness Skills; Cultural Identity);	system readiness to implement substance abuse prevention programs; - School Dynamics (presence in the school for both evidence-based and non-evidence-based prevention programming)	- 7 items for Knowledge of Drugs and Consequences of Use (modified from Gilchrist *et al.,* 1987, not standardized); - 9 items for Assertiveness Skills (modified from Scheier *et al.,* 1999, not standardized) - 6 items for Cultural Identity (modified from Gilchrist *et al.,* 1987, not standardized); - telephone survey of key informants (on average seven per community) from 14 communities (total n=100), constructs from the Community Readiness Model developed by the Tri-Ethnic Center at the University of Colorado (Oetting *et al.,* 1995).
Resnicow *et al.,* [49]	Healthy behaviors: *Primary:* past month use of cigarettes *Secondary:* - frequent cigarettes use (>20 days per month) - marijuana use; - beinge drinking - illicit drug use (cocaine/crack, methaqualone, methamphetamine) Emotional and social skills: - perceived harm of ever and regular tobacco, marijuana, and alcohol use - perceived refusal skills for five substances - smoking attitudes	- demographics (gender; ethnicity)	- binary items (nonuse/use) for each substance and period use (not standardised) - three-point scale (harm, slight harm, great harm) (not standardised); - five-point scale (refusal shills (not standardised) - ten-item neasure (smoking attitudes) (not standardised)
Seal, [50]	Healthy behaviors: - tobacco and drug use Emotional and social skills: - knowledge about the health consequences of tobacco and drug ; - attitudes toward tobacco and drug use prevention - life skills (refusal, decision-making, problem solving)	- demographics (age, gender, grade)	- 17 yes/no questions for knowledge about the health consequences of tobacco and drug use (no standardized); - 4 point scale for attitudes toward tobacco and drug use prevention (not standardized) - life skills questionnaire (not standardized); - tobacco and drug use frequency questionnaire (not standardized)
Walker *et al.,* [51]	Healthy behaviors: - condom use Emotional and social skills: - reported sexual activity; - knowledge and attitudes about HIV and emergency contraception; - attitudes and confidence about condom use;	- demographics (sex, age)	- 93 item questionnaire on knowledge and attitudes about HIV, AIDS, and emergency contraception; sexual experience; use of condoms at first and most recent intercourse. It also asked about tobacco, alcohol, and drug use, compensated sex (exchange of sex for money, goods, or favours), social networks, socioeconomic status, and intention to continue in school (not standardized).

involved students and their teachers, but not their parents, the school environment and the community [54, 58, 59, 60]. Finally, 1 (1.4%) study involved students, their parents, the school environment and the community, but not their teachers [44 (study 1)], and 1 (1.4%) study involved students and the school environment but not their parents, their teachers and the community [45].

No study involved students, their parents, their teachers, the school environment and their relevant community simultaneously.

Regarding the effectiveness of the included studies, findings were very heterogeneous about the outcomes assessed by different tools and statistical analyses. Table **3** summarises that Life Skills Training (LST) is generally effective in improving emotional and social skills, and healthy behaviours [20, 32, 42, 43, 44(study 1 and 2), 46, 48-51, 56, 58], as well as other kinds of interventions on emotional and so-cial skills, psychological wellbeing, healthy behaviours, and academic performance, namely the "Gatehouse Project" [52], "Free fruit and vegetables snacks plus Enhanced Nutrition Education" [53], "Zippis' Friends" [47], "4Rs Social-Emotional Learning Program (Reading, Writing, Respect, Resolution)" [55], "Yoga Ed Program" [57], "Kripalu Yoga" [60], "COPE (Creating Opportunities for Personal Empowerment) Healthy Lifestyles TEEN (Thinking, Emotions, Exercise, Nutrition) Program" [59], "PATHS (Positive Adolescents Training through Holistic Social Programmes" [54], "Plan for Success Goal Clarification survey" [45].

DISCUSSION

This systematic review reports the main features of universal school-based RCTs aimed to enhance the youths' emotional and social skills in order to promote their positive development and wellbeing. Furthermore, it shows

Table 2b. Outcomes and tools: "Life Skills Training" (LST) programs measuring only healthy behavior outcomes.

Study	Outcomes	Mediators or Baseline Covariates	Measures/Tools
Botvin *et al.,* [32]	- cocaine, inhalants, nonmedical pill use, heroin and other narcotics, hallucinogens use - tobacco, alcohol and marijuana use	tobacco, alcohol and marijuana current use (amount and frequency at baseline)	Not standardized scales: - 8 point scale for tobacco' frequency use 7 point scale for tobacco'amount use 9 point scale for alcohol frequency use 6 point scale for alcohol amount use 9 point scale for frequency of getting drunk 9 point scale for frequency of marijuana use
Spoth *et al.,* [56] - see also: Spoth *et al.,* [69; 70]	- alcohol initiation (AI); - cigarette initiation (CI); - marijuana initiation (MI); - monthly frequency of Alcohol Use (AF); - monthly frequency of Cigarette Use (CF); - monthly frequency of Drunkenness(DF); - monthly frequency of Marijuana Use (MF); - more problematic or serious substance use (poly-substance use)	- Sociodemographics (gender; ethnicity; living with both biological parents; free or reduced-price school lunch)	- Substance Initiation Index – 3 item (not standardized); - 4 item for substance frequency use (not standardized); - Monthly poly-substance use, 3 items (MPU) index (not standardized); - advanced poly-substance use (APU) index, 5 items (not standardized)
Spoth *et al.,* study 1 [44]	- methamphetamine use		1 item (not standardized)
Spoth *et al.,* study 2 [44]	- methamphetamine use		2 item (not standardized)
Young *et al.,* [58]	- Self-reported estimated daily energy expenditure (physical activity), - self-reported sedentary activities (television viewing and computer or Internet use), - cardiorespiratory fitness - cardiovascular disease risk factors (BMI, waist-hip ratio, waist circumference, blod pressure, total cholesterol level, lipopretein level.		- 7-day Physical Activity Recall; - submaximal 3-stage step test for cardiorespiratory fitness; - selected outcome from a questionnaire for sedentary activities (not standardized) - standard methods for height, weight, waist and hip circumference, blood pressure, - venose blood test for total cholesterol and lipoprotein

Table 2c. Outcomes and tools: Different programs (than LST) on emotional and social skills, psychological wellbeing indicators, healthy behaviors, academic performance outcomes.

Study	Outcomes	Mediators or Baseline Covariates	Measures/Tools
Bond *et al.,* [52]	Psychological wellbeing indicators - Mental health status (self reported anxiety/depression); - social relations (availability of attachments and conflictual relationships); - victimisation; - school engagement Healthy behavior - substance use - peers' substances use;	- family structure (intact; separated/divorced; other circumstances); language other than English spoken at home; cowntry of birth (Australia vs other); parents' smoking cigarettes and/or drinking alcohol; - gender	- Clinical Interview Schedule-Revised (CIS-R) - Interview Schedule for Social Interaction - 4 items addressing types of recent victimisation; - School Engagement Scale; - set of questions developed by the Center for Adoleschent Health (Patton *et al.,* 1995) to rate current smoking and drinking; - 7 days diary for students who had smoking tobacco in the past month or drunk alcohol in the past two weeks or used marijuana in the past six months.
He *et al.,* [53]	Healthy behavior - fruit and vegetable consumption Emotional and social skills - knowledge, attitude, liking, self-efficay, intention, willingness, habit, preferences and peer influences toward fruit and vegetables		- Pre-Coded 24h Fruit and Vegetable Recall Questionnaire (Haraldsdootir *et al.,* 2005); - Pro-Children Questionnaire (adapted)

Study	Outcomes	Mediators or Baseline Covariates	Measures/Tools
Holen *et al.,* [47]	Emotional and social skills - coping strategies (distraction, social withdrawal, cognitive restructuring, self-criticism, blaming others, problem solving, emotional expression, wishful thinking, social support, resignation) Psychological wellbeing indicators - mental health (emotional symptoms, conduct problems, hyperactivity/inattention, perr problems, prosocial behaviors)	- demographics (parents' socio-economic status (SES); childs' sex)	- Kidcope Questionnaire (Spirito *et al.,* 1988) - children version (7-12 years) ; - adaptation of Kidcope questionnaire – adolescent version (administered to parents) - Strenghts and Difficulties Quationnaire (SDQ), (Goodman, 1997) (parents and teachers form)
Jones *et al.,* [55]	Emotional and social skills: - Social-Cognitive Processes (hostile attribution biases; aggressive interpersonal negotiation strategies; normative beliefs about aggression); - Aggressive and Prosocial Behaviors (child aggression; child social competence); Psychological wellbeing indicators - Social-Emotional Symptomatology (child ADHD symptoms; depressive symptoms; aggressive and prosocial fantasies); Academic performance: - academic skills; - math and reading achievement; - attendance rate	- household socioeconomic status (SES) risk index (single-parent household; less than high school education; poverty at or below 100% of the federal poverty level; unemployment); - Community risk; - Child behavioral risk; - Children' sociodemographics (gender; race/ethnicity); - teacher' burnout; - teacher' experience; - classroom size	- 2 self-report questionnaires for hostile attribution biases and aggressive interpersonal negotiation strategies (adapted from the Home Interview Questionnaire (Dalhberg *et al.,* 1998; Dodge, 1986) - Normative beliefs about Aggression Scale (Huesmann & Guerra, 1997) (self report); - ADHD Symptomatology Scale (Milch *et al.,* 1982) (teacher report) for ADHD symptoms; - Diagnostic Interview Schedule for Children Predictive Scales (Lucas *et al.,* 2001) (self-report) for depressive symptoms ; - "What I Think" (Rosenfeld *et al.,* 1982) (self-report) for aggressive and prosocial fantasies; - Behavioral Assessment System for Children (Reynolds & Kamphaus, 1998) (teacher report) for child aggression and conduct problems - Social Competence Scale (CPPRG, 1999) (teacher report) for child social competence; - 9 items adapted from the Early Childhood Longitudinal Study, Kindergarten (ECLS-K) for academic skills; - New York State standardized assessment of math and reading achievement (standard reports); - NYC Department of Education standard reports for attendance rate (school years 2004-2005; 2005-2006) ; - parents' report for SES risk index - parent report on the Community Risk and Resources Questionnaire (Forehand *et al.,* 2000); - Teacher Burnout Inventory (Maslach *et al.,* 1996)
Khalsha *et al.,* [57]	Psychological wellbeing indicators - personality (emotional symptoms, school problems, internalizing problems, inattention/hyperactivity, personal adjustment, anxiety, anger control, mania, ego strenght); - mood states; Emotional and social skills: - resilience; - perceived stress; - Self-confidence during Stress; - Life Purpose and Satisfaction		- Self-Report of Personality (SRP) version of the Behavior assessment Survey for Children Version 2 (BASC-2) - Profile of Mood States short form (POMS-SF); - Resilience Scale (RS); - Perceived Stress Scale (PSS); - Inventory of Positive Psychological Attitudes-32R (IPPA)
Melnik *et al.,* [59]	healthy behaviors - phisical activity - substance use (alcohol, marijuana); academic performance Psychological and physical wellbeing indicators - depressive and anxiety symptoms; - health grade - overweight - BMI Emotional and social skills - social skills (cooperation, assertion, academic competence);	- acculturation	- pedometer steps; - Healthy Lifestyles Behavior Scale (HLBS) (self report); - Heights and Weights; - Beck Youth Inventory II (self report); - Social Skills Rating System (SSRS) (teacher report) - questions about substances use from Youth Risk behavior Survey (self report); - students' health course grade (school records); - acculturation, Habits, and Interests Multicultural Scale for Adolescents (AHIMSA) (self report)

(Table 2c.) contd….

Study	Outcomes	Mediators or Baseline Covariates	Measures/Tools
Noogle *et al.,* [60]	<u>Psychosocial Wellbeing indicators</u> - mood (Tension-Anxiety, Depression-Dejection, Anger-Hostility, Vigor-Activity, Fatigue- Inertia, Confusion-Bewilderment); - affect (positive and negative); <u>Emotional and social skills</u> - perceived stress; - positive psychological attitudes (self-confidence during stress; life purpose and satisfaction) - Resilience; - Anger expression - Mindfulness		- Profile of mood States-Short Form (POMS-SF); - Positive and Negative Affect Schedule for children (PANAS-C); - Perceived Stress Scale (PSS) - Inventory of Positive Psychological Attitudes-32R (IPPA) - 25 item Resilience Scele (RS); - State-Trait Anger Expression Inventory-2 (STAXI-2); - Child Acceptance and Mindfulness Measure (CAMM)
Shek *et al.* [54] - see also: Shek *et al.,* [71; 72; 73; 74; 75; 76]	<u>Emotional and social skills:</u> - bonding (BO); - resilience (RE); - social competence (SC); - emotional competence (EC); - cognitive competence (CC); - behavioral competence (BC); - moral competence (MC); - self-determination (SD); - self efficacy (SE); - beliefe in the future (BF); - clear and positive identity (CPI); - spirituality (S); - prosocial norms (PN); - recognition for positive behavior (RPB) - positive youth development (CPYDS-12) (bonding + resilience + social competence + emotional competence + cognitive competence + moral competence + self-efficacy + beliefs in the future + clear and positive identity + spitiual + prosocial involvement + recognition for positive behavior); - Psychosocial competence and strenghts (CPYDS-10) (resilience + social competence + emotional competence + cognitive competence + behavioral competence + moral competence + self determination + self efficacy + beliefs about the future + clear and positive identity); - Behavioral competence and Moral competence (CYPDS-2); - Cognitive-Behavioral Competence (CBC); - Prosocial Attitude (PA); - Positive Identity (PID); - General Positive Youth Development Qualities (GPYDQ).		- Chinese Positive Youth Development Scale (CPYDS)
Werch *et al.,* [45]	<u>Healthy behaviors:</u> - alcohol, cigarettes, marijuana consume; - eating habits - exercise, <u>Emotional and social skills</u> - stress management - health quality of life - self-image - behavior coupling beliefs - perceived peer prevalence and frequency of future comparisons <u>Academic performance</u> - personal development behaviors (college and career preparation)		- Personal Development and Health Survey 7

Table 3.   **Quality features of the studies included.**

Study	Standardized Measures	Follow-up ≥ 6 Months	Waves of Data ≥ 2 Academic Year	Effectiveness (p < 0.05)	Safe Practices 3 at least, among: Sequency, Active, Focused, Explicit	Whole School Approach levels
Bond *et al.,* [52]	YES (anxiety/depressive symptoms) YES (social interactions) NO (victimization) YES (school engagement) YES (cigarette and alchool use)	NO	YES	YES (substance use) NO (anxiety/depressive symptoms; social and school relationships)	YES	YES (Students) NO (Parents) YES (Teachers) YES (School environment) NO (Community)
Botvin *et al.,* [32]	YES (marijuana, cocaine, inhalants, nonmedical pill use, heroin and other narcotics, hallucinogens use)	NO	NO	YES (marijuana; inhalants; heroin and othe narcotics, hallucinogens use) NO (cocaine; non medical pill use)	YES	YES (Students) NO (Parents) YES (Teachers) YES (School environment) NO (Community)
Buhler *et al.,* [46]	NO (tobacco and alcohol use) NO (affinity toward tobacco and alcohol) NO (knowledge about life skills and life skills behaviors; refusal assertiveness)	NO	NO	YES (nicotine abuse) NO (alcohol abuse) YES (tobaco and alcohol affinity) YES (knowledge skilled behaviors; life skills) NO (Knowledge unskilled behaviors; life skills deficit) YES (Knowledge skilled behaviors on all outcomes) NO (life skills on tobacco and alcohol affinity) YES (life skills on nicotine abuse in smokers at baseline)	YES	YES (Students) NO (Parents) YES (Teachers) YES (school environment) NO (Community)
Eisen *et al.,* [42] - see also: Eisen *et al.,* [68]	YES (tobacco, alcohol, illegal/illicit drugs use) YES (intention to use substance) YES (social influences) YES (interpersonal perceptions) YES (comunication skills) YES (self efficacy) YES (sensation-seeking)	NO	NO	YES (marijuana' lifetime and 30-day use) NO (lifetime and 30-day use of cigarettes, other illicit substances, alcohol; last 30-day binge drinking) YES (refusal self efficacy for alcohol and marijuana) NO (intention, perceived harm perceived peer use/close friend for all substance; refusal self efficacy for cigarettes and cocaine)	YES	YES (Students) NO (Parents) YES (Teachers) YES (school environment) NO (Community)
Fitzpatrick *et al.,* [20]	YES (prosocial behavior; emotional and behavioral difficulties; active coping/less use of avoidance) NO (help seeking; view of school social environment)	YES	NO	YES (in the enhanced (EP) intervention whole group for peer problems; at risk EP boys for emotional and behavioral difficulties, hyperactivity and total difficulties) NO (EP for coping strategies) YES (in the standard intervention (SP) group for help seeking)	Both EP and SP interventions: YES	Both EP and SP interventions: YES (Students) NO (Parents) YES (Teachers) YES (school environment) YES (Community)
He *et al.,* [53]	YES (fruit and vegetable consumption) YES (knowledge, attitude, liking, self-efficay, intention, willingness, habit, preferences and peer influences toward fruit and vegetables)	NO	NO	Yes YES (in FFVS+ENE intervention for fruit and vegetables consumption at school) NO (in FFVS+ENE intervention for fruit and vegetables consumption at home) YES (in FFVS+ENE intervention for liking toward fruit and vegetables) YES (adverse outcome in FFVS intervention: unfavorable change in self efficacy, intention and peer influence in vegetable consumption	FFVS+ENE intervention: YES	FFVS+ENE intervention: YES (Students) NO (Parents) YES (Teachers) YES (school environment) YES (Community)

(Table 3) contd….

Study	Standardized Measures	Follow-up ≥ 6 Months	Waves of Data ≥ 2 Academic Year	Effectiveness (p < 0.05)	Safe Practices 3 at least, among: Sequency, Active, Focused, Explicit	Whole School Approach levels
Holen *et al.,* [47]	YES (coping strategies) YES (mental health: emotional symptoms; conduct problems; hyperactivity/inattention; peer problems, prosocial behaviors)	NO	NO	YES (children and parents for coping strategies: children for oppositional strategies; parents for active and support seeking strategies) NO (parents and teachers for emotional symptoms; conduct problems; hyperactivity/inattention; peer problems, prosocial behaviors) YES (teachers for impact of mental health problems)	YES	YES (Students) NO (Parents) YES (Teachers) YES (school environment) NO (Community)
Huang *et al.,* [48]	NO (intention, attitude, subjective norm, perceived behavioral control about drug use) NO (life skills)	NO	NO	YES (in LST group for life skills and attitude, subjective norm, perceived behavioral control, intention about drug use)	YES	YES (Students) NO (Parents) YES (Teachers) YES (school environment) NO (Community)
Johnson *et al.,* [43]	NO (Harmfull Legal Products (HLP) use in the past 30 days: inhalants, prescription medicines, over-the-counter medications, common household products) NO (substance use in the past 30 days: tobacco, alcohol, marijuana or hashish) NO (Risk factors: Peer Use of HLPs; Peer Normative Beliefs about HLPs); NO (Protective factors: Knowledge of Drugs and Consequences of Use; Assertiveness Skills; Cultural Identity);	YES	NO	YES (harmful legal products, inhalants the most) NO (tobacco, alcohol, marijuana) NO (risk and protective factors on substance use)	YES	YES (Students) NO (Parents) YES (Teachers) YES (school environment) NO (Community)
Jones *et al.,* [55]	YES (Social-Cognitive Processes: hostile attribution biases; aggressive interpersonal negotiation strategies; normative beliefs about aggression) YES (Social-Emotional Symptomatology: child ADHD symptoms; depressive symptoms; aggressive and prosocial fantasies) YES (Aggressive and Prosocial Behaviors: child aggression; child social competence) YES (Academic Performance: academic skills; math and reading achievement; attendance rate)	NO	YES	YES (social-cognitive processes and social-emotional symptomatology) YES (aggressive and socially competent behavior) No (main effect for academic functioning) YES (chidren at behavioral risk at baseline for academic functioning: maths and reading achievement) NO (chidren at behavioral risk at baseline for social and emotional skills)	YES	YES (Students) NO (Parents) YES (Teachers) YES (school environment) NO (Community)
Khalsha *et al.,* [57]	YES (emotional symptoms, school problems, internalizing problems, inattention/hyperactivity, personal adjustment, anxiety, anger control, mania, ego strenght); YES (mood states); YES (resilience); YES (perceived stress); YES (Self-confidence during Stress); YES (Life Purpose and Satisfaction)	NO	NO	YES (anger control, fatigue, resilience) NO (emotional symptoms, school problems, internalizing problems, inattention/hyperactivity, personal adjustment, anxiety, mania, ego strenght, mood states, self-confidence during stress, life purpose and satisfaction)	YES	YES (Students) NO (Parents) NO (Teachers) NO (school environment) NO (Community)
Melnyk *et al.,* [59]	YES (healthy lifestyles behaviors: physical activity) YES (health grade) YES (overweight) YES (BMI) YES (depressive and anxiety symptoms); YES (social skills:cooperation, assertion, academic competence); YES substance use (alcohol, marijuana); YES academic performance	YES	NO	YES (physical activity; BMI; social skills: coperation, assertion, academic performance; health grade; substance use (alcohol); overweight) NO (substance use: marijuana; anxiety and depressive symptoms)	YES	YES (Students) NO (Parents) YES (Teachers) NO (school environment) NO (Community)

(Table 3) contd….

Study	Standardized Measures	Follow-up ≥ 6 Months	Waves of Data ≥ 2 Academic Year	Effectiveness (p < 0.05)	Safe Practices 3 at least, among: Sequency, Active, Focused, Explicit	Whole School Approach levels
Noogle *et al.,* [60]	Psychosocial Wellbeing: YES (mood: total mood disturbance, Tension-Anxiety, Depression- Dejection, Anger-Hostility, Vigor-Activity, Fatigue-Inertia, Confusion-Bewilderment); YES (affect: positive and negative); YES (perceived stress); YES (positive psychological attitudes: self-confidence during stress; life purpose and satisfaction) Self-Regulatory Skills: YES (Resilience) YES (Anger expression) YES (Mindfulness)	NO	NO	YES (Psychological wellbeing: total mood disturbance and tension/anxiety; negative affect) NO (Psychological wellbeing: Depression- Dejection, Anger-Hostility, Vigor-Activity, Fatigue- Inertia, Confusion-Bewilderment; positive affect; positive psychological attitudes; perceived stress) NO (self regulatory skills)	YES	YES (Students) NO (Parents) YES (Teachers) NO (school environment) NO (Community)
Resnicow *et al.,* [49]	NO (past month use of cigarettes) NO (lifetimie use of cigarettes) NO (frequent cigarettes use: >20 days per month) NO (past month marijuana use) NO (past month beinge drinking) NO (past month illicit drug use: co-caine/crack, methaqualone, methamphetamine) NO (perceived harm of ever and regular tobacco, marijuana, and alcohol use) NO (perceived refusal skills for five substances) NO (smoking attitudes)	NO	NO	NO (past month use, lifetime use, frequent use of cicarettes, past month use of marijuana, past month binge drinking, past month use of illicit drug use) YES (KEEP LEFT for males and females/males Black Africans) YES (LST for females and females/males "colored") NO (for females/males indian and white) YES (KEEP LEFT for males about past month marijuana use) YES (KEEP LEFT and LST for females about past month marijuana use) YES (KEEP LEFT and LST for males about past month bing drinking: adverse outcome) YES (KEEP LEFT for females about past month illicit drugs) NO (perceived harm, self-efficacy, drug attitudes) YES (KEEP LEFT for males about perceiving harm of regular use) YES (KEEP LEFT for black about perceiving harm of regular use) YES (LST for black and colored about perceiving harm of regular use)	Both LST and KEEP LEFT interventions: YES	YES (Students) NO (Parents) YES (Teachers) YES (school environment) NO (Community)
Seal, [50]	NO (knowledge about the health consequences of tobacco and drug) NO (attitudes toward tobacco and drug use prevention) NO (life skills: refusal, decision-making, problem solving) NO (tobacco and drug use)	YES	NO	YES (knowledge about the consequence of tobacco and drug; attitudes toward tobacco and drug use prevention; life skills) NO (tobacco and drug use)	YES	YES (Students) NO (Parents) NO (Teachers) NO (school environment) NO (Community)
Shek *et al.* [54] - see also: Shek *et al.,* [71; 72; 73; 74; 75; 76]	YES (Positive Youth Development: bonding; resilience; social competence; emotional competence; cognitive competence; behavioral competence; moral competence; self-determination; self efficacy; beliefe in the future; clear and positive identity; spirituality; prosocial norms; recognition for positive behavior)	YES	YES	YES (positive self identity, prosocial behavior, recognition of positive behavior) YES (more stable rate of growth in moral competence and behavioral competence) YES (students who regarded the program to be helpful in problems behaviors)	YES	YES (Students) NO (Parents) YES (Teachers) NO (school environment) NO (Community)

(Table 3) contd....

Study	Standardized Measures	Follow-up ≥ 6 Months	Waves of Data ≥ 2 Academic Year	Effectiveness (p < 0.05)	Safe Practices 3 at least, among: Sequency, Active, Focused, Explicit	Whole School Approach levels
Spoth *et al.,* study 1 [44]	NO (past year methamphetamine use)	YES	YES	YES (ISFP for past year methanphetamine use) NO (PDFY for past year methanphetamine use)	Both PDFY and ISFP: YES	Both PDFY and ISFP: YES (Students) YES (Parents) NO (Teachers) YES (school environment) YES (Community)
Spoth *et al.,* study 2 [44]	NO (past year and lifetime methamphetamine use)	YES	YES	YES (LST+SFP 10-14 for lifetime use) YES (LST only for lifetime use)	Both LST and SFP 10-14: YES	For SFP 10-14 see ISFP in previews row; LST: YES (Students) NO (Parents) YES (Teachers) YES (school environment) NO (Community)
Spoth *et al.,* [56] - see also: Spoth *et al.,* [69; 70]	NO (alcohol, cigarettes, marijuana initiation) NO (monthly frequency of Alcohol, Drunkenness Cigarette Marijuana Use) NO (more problematic or serious substance use: poly-substance use)	YES	YES	YES (one or both interventions on all substance initiation and for polysubstance use in higher risk subsamples) YES (accumulation one or both interventions benefits on outcomes)	Both LST and SFP 10-14: YES	For SFP 10-14 see ISFP in previews row; LST: YES (Students) NO (Parents) YES (Teachers) YES (school environment) NO (Community)
Walker *et al.,* [51]	NO (condom use, reported sexual Activity, knowledge and attitudes about HIV and emergency contraception, attitudes and confidence about condom use)	YES	NO	NO (condom use) YES (both intervention on knowledge of HIV) YES (LST + emergency contraception on knowledge of emergency contraception) YES (both intervention on sexual behaviors)	Both LST and LST + emergency contraception YES	Both LST and LST + emergency contraception YES (Students) NO (Parents) YES (Teachers) YES (school environment) NO (Community)
Werch *et al.,* [45]	YES (risk behaviors: alcohol, cigarettes, marijuana consume); YES (health promotion behaviors: eating habits, exercise, stress management) YES (personal development behaviors: college and career preparation) YES (health quality of life) YES (self-image) YES (behavior coupling beliefs; perceived peer prevalence and frequency of future comparisons)	NO	NO	YES (Goal Survey + Career Consultation on alcohol use, marijuana use, exercise, college preparation, career preparation, nutrition habits, behavior coupling)	All interventions YES	All interventions YES (Students) NO (Parents) NO (Teachers) YES (school environment) NO (Community)
Young *et al.,* [58]	YES Self-reported estimated daily energy expenditure (physical activity), NO self-reported sedentary activities (television viewing and computer or Internet use), YES cardiorespiratory fitness YES cardiovascular disease risk factors (BMI, waist-hip ratio, waist circumference, blod pressure, total cholesterol level, lipoprotein level)	NO	NO	YES (spending more physical education class time in moderate to vigouros activity) NO (daily energy expenditure, moderate, hard or very hard intensity expenditure,) YES (self-reported sedentary activities) YES (both interventions on cardiorespiratory fitness)	YES	YES (Students) NO (Parents) YES (Teachers) NO (school environment) NO (Community)

promising findings about the effectiveness of such interventions on the outcomes considered by the authors.

The studies included went openly beyond a problem-focused approach to embrace a more positive view of mental health to promote youths' wellbeing [1, 3, 8]. Collectively, these findings build on the positive results reported by other systematic reviews examining the promotion of positive development and wellbeing of children and teenagers in schools [9-12, 18, 22, 41].

Due to the variety in age/school grade of participants, characteristics of intervention and control groups, duration of programs and follow-up, assessed outcome and relevant

tools, a direct comparison among the included studies is very difficult.

Overall, the interventions targeted social and emotional competences and attitudes about oneself, the others and the school. The main aim of these interventions was enhancing these skills and/or the healthy behaviours of the students (i.e. to prevent substance abuse) and/or promoting their psychological wellbeing (i.e. regarding mood and affects) and/or improving their academic performance.

While only small percentages of the included studies collected data at ≥ 6 month follow-up after the end of the intervention (40.9%) or during at least two academic years by repeated measures (27.3%), the effects remained statistically significant by the time they were assessed. However, many included studies compared the groups exposed to such interventions to groups exposed to any kind of intervention. or treatment as usual (i.e. curricular health education).

This systematic review differs in emphasis from previous research syntheses by including exclusively universal school-based RCTs aimed to test the effectiveness of interventions focused on emotional and social skills improvement to promote the youths' wellbeing.

Noteworthy, among the texts excluded from this review, 15 papers described RCTs in this field with data analysis still pending. However, even if the researchers are increasingly attempting to conduct studies with rigorous experimental design, there is a range of practical and human impediments to using a "full" controlled randomisation in the school setting, such as objections from line staff and parents who feel that random assignment excludes some children having the same needs, and issues of access to parental consent or permission [12].

Furthermore, the studies included in this review aimed at a whole-school approach that promote "bottom-up" principles such as empowerment, autonomy, participation [3], and non-prescriptive and flexible practices that emphasize the need of end-user involvement. These features could contrast basically with manualized approaches that contain strict requirements for program fidelity, hard outcomes and measurable changes [10].

In this sense, the effectiveness of the RCTs included in this review may be relative in statistical terms, but it represents effects of outcomes that are important in the real world, are relatively large and similar to, or higher in, magnitude than those obtained by many other established preventive and treatment interventions in the fields of social sciences and medicine [9, 22, 61].

As Weare *et al.* [10] already pointed out, many reviews of school-based interventions state that the acquisition of social and emotional skills was associated with a wide range of important health outcomes in the youth, including: positive youth development, character education, a reduction in depression and anxiety, conduct disorders, violence, bullying, conflict, and anger. This amount of data allows considering emotional and social skills improvement as an outcome in itself [10].

In this review, emotional and social skills were assessed as unique outcomes in two studies implementing Life Skills

Training (LST) specifically [20, 48], and in one study implementing a different program than LST [55]. Three more studies implementing different programs than LST assessed emotional and social skills as outcomes together with psychological wellbeing indicators [47, 52, 57, 60].

On the other hand, 5 out the 13 studies implementing LST evaluated only healthy behavior outcomes without assessing emotional and social skills as neither outcomes or mediators 32; 44 (study 1 and 2); 56; 58]. This choice could be due in part to the amount of evidence about the above mentioned association between life skills and health outcome improvement. At the same time, it marks a series of methodological issues and limits.

While healthy behaviors and academic performance are relatively easy to assess by specific indicators, some constructs such as positive youth development, the youths' psychological wellbeing and life skills are difficult to define univocally [8; 12]. Not surprisingly, many studies included in this review use no standardised measures, because their authors developed *ad hoc* measures to assess emotional and social skills and psychological wellbeing, as outcomes or mediators. This is probably due in part to the uncertain definition of these constructs, but also to the lack of studies aiming to develop and validate instruments that may assess the life skills and psychological wellbeing of the youth [9, 10, 12, 18, 41, 62].

Regarding the included studies that use standard tools, these constructs were measured by a single tool for each skill (i.e. Resilience Scale [63] to assess resilience in the study by Khalsha *et al.* [57]; Kidcope Questionnaire [64] to assess coping strategies in the study by Holen *et al.* [47]). Noteworthy some included studies [46, 54] attempted to build some tools to assess life skills or positive youth development but showed some limits, mainly concerning the validity tests on such tools (i.e. internal reliability and construct validity).

In this sense, the effectiveness of Life Skills Training (LST) as well as of other kinds of intervention on outcomes such as healthy lifestyle behaviours, academic performance, psychological wellbeing, with or without assessment of emotional and social skills reliably (see Tables **1b**, **2b**, and **3**), is a critical point. Other variables than life skills could affect findings. These issues regard also those studies where the mediation effects of social and emotional skills on the main outcomes were postulated but not tested.

Another important finding of the current review is that in most of the included studies, classroom teachers effectively conducted programs to enhance their students' emotional and social skills and promote their wellbeing. Only in two included studies was the intervention implemented by external personnel, specialized in yoga techniques [57] and career coaching [45]. Therefore, this kind of interventions can be part of the routine educational practices and require external specialized personnel for teachers' training only.

Furthermore, the programs addressed to enhance the emotional and social skills of the young and promote their wellbeing are effective at all educational levels (elementary, middle, and high school).

As already emphasized by other authors [9, 10, 12, 18, 41], the SAFE practices (Sequential, Active, Focused, Ex-

plicit) and a whole-school approach moderate positive student's outcomes and distinguish evidence-based interventions in the school setting.

In this review, all the included studies contained no less than three SAFE practices considered as dichotomous variables "present/absent". Even if it could be preferable to evaluate SAFE practices as continuous variables [9, 65], we did not examine them this way due to the lack of information in the included study reports. Further research is needed to establish which SAFE practice impacts specifically on student outcomes, especially on their emotional and social skills. Some SAFE practices, in fact, may be more important than others depending on the nature and the number of evaluated outcomes, the age of students and their development stage, but also on ecological features, such as the school ethos and environment.

Furthermore, previous research pointed out that to achieve optimal impact, the work on personal skills need to be embedded within a whole-school, multi-component approach which includes changes to school ethos, teacher training, liaison with parents, parenting education, community involvement [10, 18]. Most of the studies included in this review regard multi-component interventions targeted at no less than two of the following subjects: students, parents, teachers, school environment, and community.

However, only three RCTs included in this review [44 (study 1 and 2), 56] involved parents in the interventions tested. In the study 1 by Spoth *et al.* [44] and in two more included studies [16, 54] also the community was involved. From an ecological and systemic point of view, when interventions in the school setting are combined with efforts to create environmental support and reinforcement from family members, health professionals, other concerned community members, and the media, there is an increased likelihood that students will adopt positive social and health practices [20, 40, 53, 66, 67].

LIMITATIONS

This systematic review was performed by searching in the Pubmed/Medline database only. Other databases, such as PsycInfo/Ovid, could provide more findings about school-based RCTs.

More school-based RCTs could be found by searching among the references of the studies included in the systematic review as well as in the excluded papers, reviews and/or meta-analyses.

CONFLICT OF INTEREST

The authors confirm that this article content has no conflict of interest.

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