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**Originality/value** – Research on mental health promotion using a pedagogical approach is rare as most studies focus on mental health symptomatology and psychotherapy techniques training.
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Keywords: Mental health promotion, educational intervention, resilience, emotional wellbeing, adolescents, preadolescents.

Paper type: Literature review.

Introduction

Adolescent mental health issues have become a major concern worldwide; one in every six people aged 10–19 suffers from a mental health disorder (WHO, 2020). Mental health disorders are conditions characterized by altered emotions, thinking and/or behavior that are associated with distress or difficulties in social, occupational, academic and familial environmental functions (APA, 2018).

However, COVID-19 has caused the imposition of social isolation measures that have changed the lifestyles of young people. Future mental health concerns may increase as peer interaction—a vital aspect of this age group’s development—has been restricted (Orben et al., 2020). The effects of social deprivation on the development of adolescents and their mental health are expected, as social isolation is associated with an increase in depressive symptoms, low self-esteem, and self-harm (Hall-Lande et al., 2007).

Moreover, adolescence has been identified as a critical period in identity development and a determining factor for the onset of psychopathologies (Sharp and Wall, 2018). Approximately 50% of adult mental disorders begin before the age of 14, and 75% before the age of 24, though the majority remain untreated (Kessler et al., 2005). Adolescents experience constant physical, cognitive, and social changes that act...
as stressors (Voltas and Canals, 2018) and are possible triggers of mental health problems.

As this stage in life is critical for the emergence of mental health problems, promoting universal mental health interventions must focus on the wellbeing of both adolescents and preadolescents. Additionally, preadolescence onsets (9–11 years of age) predict later mental health concerns (Keenan et al., 2008), while an early onset increases the risk of persistence and comorbidity for mental health disorders (Caspi et al., 2020).

To access this population, schools are being tasked with the responsibility of reaching out to this population. Schools are environments in which most adolescents spend majority of their time, and they provide an ideal setting for this population (WHO, 2001). Educational stages that include adolescents and preadolescents are mostly secondary schools and middle schools or primary schools, depending on the country’s educational system. These schools are frequently used to implement preventive and therapeutic interventions through psychotherapy, as well as skill training, as reviewed by Das et al. (2016).

Nowadays, universal mental health/wellbeing school-based promotion programs are a combination of a variety of interventions, as reviewed by O’Connor et al. (2018). Nevertheless, numerous programs focus on promotion by reducing risk factors based on therapeutic techniques’ application (e.g. cognitive behavioral techniques and mindfulness). Therefore, schools are being studied as convenient environments for intervention, though educational contributions in the development of mental health remain less explored (O’Toole, 2017).

Promoting mental health

Mental health is defined as a state of wellbeing, not just the absence of mental illnesses. This state enables people to recognize their abilities, deal with stress in life, work productively, and contribute to their community (WHO, 2018). Thus, mental health is considered to be found on the mental health continuum, which includes multiple degrees of wellbeing different from complete health and diagnosable diseases (Keyes, 2002). In this continuum, there is room for promoting the mental health of every student who aspires to flourish. Mental health promotion focuses on developing competencies, resources, and strengths, whereas mental disorder prevention is concerned with specific illnesses and attempts to minimize their incidence, prevalence, or severity (Barry, 2001). Additionally, health promotion aims to support social and personal development by providing health-related information and education and enhancing life skills (WHO, 1986). Mental health promotion programs frame mental health in a positive light and focus on strengths, abilities, and self-efficacy (Weissberg et al., 1991).

In mental health promotion, the concept of resilience allows for understanding the relationship between protective and risk factors. Resilience is defined as a lifelong process of learning that develops the ability to maintain or regain mental health despite
experiencing adversity (Wald et al., 2006) and that involves facing risk situations by putting capacities and resources at stake (Muñoz and de Pedro, 2005). Protective factors for resilient adolescents are peer acceptance, family connectedness, school connectedness, and personal attributes such as high self-esteem (Costello et al., 2008), high perceived self-efficacy (Sagone et al., 2020), optimism, and life satisfaction (Piko et al., 2009).

Because of resilience’s critical role in student mental health, educational mental health promotion interventions also target resilience-related skills. These skills can be labeled as self-efficacy, self-esteem, and problem-solving, coping, life, communication, and healthy relationships skills. As students spend the majority of their developmental years in a formal educational setting, schools play a significant role in teaching resilience through the acquisition of social and emotional skills (Ciarrochi et al., 2019). Social and Emotional Learning (SEL) programs are educational interventions that target wellbeing through social and emotional skills. CASEL (2020) describes SEL as an integral part of education that comprises knowledge, skills, and attitude acquisition. SEL programs promote wellbeing by working on aspects such as self-awareness, self-management, social awareness, relationship skills and responsible decision-making. These interventions have proved efficacy in improving emotional adjustment, behavioral adjustment, and internalizing symptoms, as reviewed by Goldberg et al. (2019). SEL programs often are multicomponent interventions with a whole-school approach and comprise coordinated learning curricula and actions concerning the school environment, family-school partnerships, and community-school partnerships (CASEL, 2020).

When promoting resilience, other protective factors included in the promotion of wellbeing are goals definition, hope, optimism, and life satisfaction. Optimism (Sánchez and Méndez, 2009) and life satisfaction (Proctor et al., 2009) are related to depressive symptomatology prevention as resources for coping with hopelessness. Hope and optimism promotion interventions have demonstrated efficacy in suicide (Horwitz et al., 2017) and depression prevention (Shatté et al., 2000). Nevertheless, these programs are based on the training of psychology techniques, and educational interventions on learning hope are focused on skill development.

Moreover, educational wellbeing promotion programs can target mental health literacy, anti-stigma education, and help-seeking behavior. Mental health literacy is defined as the competencies and knowledge that people need for understanding mental disorders, obtaining and maintaining mental health, enhancing help-seeking, and decreasing stigma (Kutcher et al., 2016). The purpose of mental health literacy programs is to inform and educate participants about mental health concerns, early detection of psychological problems, and appropriate help-seeking mechanisms (Kelly et al., 2007). Nevertheless, help-seeking behavior faces the mental health stigma barrier (Clement et al., 2015; Wynaden et al., 2014). Anti-stigma education aims to change public perceptions of mental health problems to reduce stigma and discrimination (Pejović-
Milovancević et al., 2009). These interventions can consist of a learning curriculum or combine it with intergroup contact practices and people who also suffer from mental conditions to potentiate the understanding of mental illnesses and experiences of people with mental health conditions and combat the stigmatization of attitudes and behaviors (Yamaguchi et al., 2011).

The present study

The primary purpose of this review is to determine the contributions of universal school-based educational programs to the current and future worldwide youth mental health condition. To accomplish this, the research question for this review was formulated by following a PICO strategy (Schardt et al., 2007):

What are the contributions of universal school-based mental health educational promoting interventions in the wellbeing of preadolescents and adolescents?

To address this question, it is necessary to examine the characteristics and outcomes of educational interventions developed in the school setting and identify where the goals and potential utility of pedagogical responses for mental health promotion. Therefore, studies published in the last decade were reviewed to conduct a study on the latest trends in educational mental health promotion programs, such as resilience, mental health literacy or SEL.

Educational programs are sets of educational activities designed to achieve predetermined objectives. Achieving this goal frequently involves a sequence of structured learning experiences (UNESCO, 1997). This study intends to better understand the educational focuses of school-based mental health promotion programs that are integrated into the school’s teaching curricula and other educational initiatives. Additionally, the review considered other possible didactic characteristics that may influence outcomes such as intervention flexibility. The educational program content can be sequenced and organized into specific implementation manuals, or the program’s implementation and sequencing can be flexible. Flexible intervention allows for a better intervention adjustment to both context and student learning needs, while manualized interventions are expected to have similar effects on every implementation setting as they follow specific didactic guidelines (Durlak et al., 2011).

As adolescence (12–18 years of age) and preadolescence (9–11 years of age) are critical mental health intervention stages, this review particularly focused on interventions including middle school students (and its equivalent grades in primary schools) and secondary school. Therefore, the resulting sample age range considered was 8 to 21 years of age. The sample included 8-year-old students because these are also included in the academic year of 9-year-old. Moreover, students up to the age of 21 were included because other studies included high school students of this age.

Method
A systematic search was conducted in March 2021 in accordance with the PRISMA 2020 guidelines (Page et al., 2021). Academic and healthcare databases including ERIC, Education Database, APA PsycInfo, APA PsycArticles, Psychology Database, and PubMed were used. Search terms included: educational program, educational intervention, young people, adolescent, school-based, mental health promotion, emotional wellbeing, resilience, social-emotional learning, and effect.

**Inclusion criteria**
To be eligible for inclusion in the final sample, reports needed to have (a) been published between 2011 and February 28th, 2021, (b) evaluated educational school-based universal mental health promotion programs, (c) targeted population aged 8-21, (d) incorporated dependent variable measures relating to general mental health, emotional/mental wellbeing, emotional resilience, self-efficacy, anxiety symptoms or depressive symptoms, and (e) included quantitative pre-test and post-test outcome measures.

Articles included assessment of educational programs, which are characterized by the presence of learning goals for mental health/wellbeing, such as knowledge goals, attitudinal goals, and/or skill development competencies. Educational programs must have specific learning curricula designed for delivery through teaching-learning processes and pedagogical practices by educators or trained personnel. Additionally, learning curricula can be combined with other pedagogical actions performed in formal school settings that involve educational agents or environmental changes (e.g., family workshops, peer tutoring, and student-help networks).

**Exclusion criteria**
A study was excluded due to the following reasons: (a) evaluation of specific disorder prevention programs, (b) intervention-target participants with preexisting mental health problems, (c) evaluation of therapeutic intervention programs or programs on specific psychotherapy techniques (e.g., cognitive-behavioral intervention programs), and (d) sample participants are adults over the age of 21.

**Study selection**
Academic databases identified 801 records using the search string made of all combined search terms. After the removal of all duplicates, 468 records remained. Following the exclusion of titles, 73 reports were sought for retrieval, of which 65 were assessed for eligibility. Additional 24 papers were identified by term search and bibliographic search in reference lists, of which 20 were retrieved. A total of 85 reports were thoroughly assessed.

After excluding reports that did not meet the criteria, 14 reports (belonging to 14 studies) were eventually included.
Figure 1 represents the study selection and assessment process using a PRISMA 2020 flow diagram. A PRISMA 2020 checklist was employed to conduct the review (Page et al., 2021).

-----Figure 1 (PRISMA chart describing search and inclusion procedures)-----

**Study Coding**

Table I summarizes the characteristics of the 14 studies selected. A single researcher conducted the coding process. Studies were coded using general codes: sample size, participants, study design, method, comparison group and results. Moreover, 14 educational interventions of the assessed studies are synthesized in Table II. Specific educational intervention codes were used based on the literature of previous school-based mental health promotion programs: duration, educational foci of the interventions, intervention structure (manualized or flexible implementation), intervention components (curricula, outside-of-class initiatives, and whole-school intervention), gauging mechanism, and outcomes.

-----Table I (Table detailing study characteristics)-----

-----Table II (Table detailing educational intervention characteristics)-----

**Results**

Of the selected studies, 12 were conducted in the last five years (i.e., 2016 to 2021). The two remaining studies were published between 2011 and 2015. Half of the studies used quasi-experimental designs and allocated entire school classes to treatment groups. Nevertheless, cluster designs were used by the other half of the studies. Nine of the studies included a comparison control group. Besides, two used different age comparison groups and one study employed different treatments comparison groups. The study’s methodology was quantitative in nine studies, and both quantitative and qualitative (mixed methods) in five studies.

**Risk of biased assessment**

Cochrane risk of a biased assessment tool (Higgins and Green, 2011) was used to evaluate the risk of biases in the included studies.

Only two studies used a random sequence generation method (Chisholm et al., 2016; Dray et al., 2017) and were rated low for risk of potential biases. Two studies did not explain sequence generation (Gigantesco et al., 2015; Green et al., 2021), and one study was not fully randomized (Pannebakker et al., 2019); these were rated unclear. The rest of the studies were not randomized and were rated high. The risk for biases associated with allocation concealment was explained in only one of the studies (Chisholm et al., 2016). This dimension was rated unclear for every study.
Blinding of participants and staff was not discussed in any of the studies. Due to the educational condition of these interventions, participants were aware they were learning about a specific topic or participating in a learning program. Every study was rated low for this dimension, except one which was rated unclear (Kirby et al., 2021), as people volunteered to participate in the program.

Two studies were rated unclear for the dimensional bias blinded outcome assessment (Pannebakker et al., 2019; Raval et al., 2019) as they included teachers who were been blinded. However, other studies obtained a low-risk rate as the outcomes were measured using self-report instruments.

Incomplete outcome data risk for biases was high for two studies (Kirby et al., 2021; Punukollu et al., 2020), unclear for two studies (Kelley et al., 2021; McMullen and McMullen, 2018), and low for the remaining ten studies.

In the dimension bias selective reporting, the level of risk was predominantly low, and only three studies were rated unclear (Kelley et al., 2021; Kirby et al., 2021; Punukollu et al., 2020).

Additional critical sources of biases such as gender differences between experimental groups (Kelley et al., 2021) and sample size (Kirby et al., 2021) were found; these were rated high. Two studies obtained unclear risk of biases caused by differences in treatment implementation (Dray et al., 2017) and nested design (Green et al., 2021).

The Robvis visualization tool was used to create summary tables and charts assessing the risk for bias (McGuinness and Higgins, 2021). These have been depicted in Figures 2 and 3.

Participants
A total of 12,040 participants with an age range of 8–21 years (248 primary school, 390 middle school, and 11,402 secondary school students) were included in the 14 selected studies. Participants included 6,028 male, 4,566 female, and 1,446 unspecified gender students.

There was a wide range of study sample sizes; one study had fewer than 100 participants (Kirby et al., 2021), three had 100–200 participants (McMullen and McMullen, 2018; Raval et al., 2019; Veltro et al., 2017), four had 200–400 participants (Gigantesco et al., 2015; Green et al., 2021; Kelley et al., 2021; Punukollu et al., 2020), four had 700–1500 participants (Chisholm et al., 2016; Lapshina et al., 2019; Pannebakker et al., 2019; Schwager et al., 2019) and two had over 2,000 participants (Dray et al., 2017; Wigelsworth et al., 2012).

Educational focuses
Analysis of educational programs described in studies generated two primary educational foci: resilience traits and skills and mental health education.

The first one, “resilience traits and skills,” was present in 13 studies. This focus was a compound of primary areas, including social and emotional aspects, problem-solving skills, self-efficacy, self-esteem, and optimism. Social and emotional aspects were identified in 11 studies. This domain was included in programs targeting SEL (Green et al., 2021; Kelley et al., 2021; Kirby et al., 2021; Lapshina et al., 2019; Raval et al., 2019; Wigelsworth et al., 2012), social skills (Pannebakker et al., 2019), emotional education (Schwager et al., 2019), communication skills (Dray et al., 2017; Green et al., 2021; Lapshina et al., 2019), social cohesion/integration (McMullen and McMullen, 2018; Schwager et al., 2019), and peer support (Punukollu et al., 2020).

Other resilience skills were included in 8 interventions. This dimension was included in the curricula of programs aiming for resilience improvement (Dray et al., 2017; Kelley et al., 2021), life skills (McMullen and McMullen, 2018; Schwager et al., 2019; Veltro et al., 2017), coping skills (Punukollu et al., 2020), and problem-solving skills (Dray et al., 2017; Gigantesco et al., 2015; Green et al., 2021; Veltro et al., 2017).

Moreover, educational targets related to self-efficacy (Dray et al., 2017; Pannebakker et al., 2019; Veltro et al., 2017) and self-esteem (Pannebakker et al., 2019; Schwager et al., 2019) are included in 4 interventions.

In addition, optimism related targets were identified in 3 programs. Targets of this dimension were related to developing hope and optimism (Kirby et al., 2021) and goals definition (Dray et al., 2017; Veltro et al., 2017).

The second educational focus, “mental health education,” was found in 5 educational programs. Its targets are related to reducing mental health stigma (Chisholm et al., 2016; Gigantesco et al., 2015), raising mental health awareness and literacy (Chisholm et al., 2016; Gigantesco et al., 2015; Kirby et al., 2021; Punukollu et al., 2020), and promoting help-seeking behaviors (Chisholm et al., 2016; Lapshina et al., 2019).

Structure of educational interventions
Educational interventions described in the selected studies differed in their implementation structure. Manual-based educational programs, comprising structured and sequenced sessions and activities, accounted for 11 interventions (Chisholm et al., 2016; Gigantesco et al., 2015; Green et al., 2021; Kelley et al., 2021; Kirby et al., 2021; Lapshina et al., 2019; McMullen and McMullen, 2018; Pannebakker et al., 2019; Punukollu et al., 2020; Raval et al., 2019; Veltro et al., 2017). The remaining three programs consisted of flexible implementation activities and curricula from which teachers could select content and activities (Dray et al., 2017; Schwager et al., 2019; Wigelsworth et al., 2012).

Intervention components
Single component interventions consisting of a learning curriculum accounted for 9 studies (Gigantesco et al., 2015; Green et al., 2021; Kelley et al., 2021; Kirby et al., 2021; Lapshina et al., 2019; McMullen and McMullen, 2018; Pannebakker et al., 2019; Raval et al., 2019; Veltro et al., 2017). Two studies used a whole-school approach, combining learning curricula with family partnerships and school environmental actions (Dray et al., 2017; Wigelsworth et al., 2012). Two studies included components other than curricula, such as a peer support network and an educational mobile app (Punukollu et al., 2020) and aimed to transform the school environment through the use of visual aid, such as posters, to raise mental health awareness (Schwager et al., 2019). One of the studies included intergroup contact with people suffering mental health concerns combined with learning curricula (Chisholm et al., 2016).

Outcome measures

Measure instruments for mental health concerns were included in 13 studies. Intervention outcomes were measured in terms of overall wellbeing and mental health symptomatology using the Strengths and Difficulties Questionnaire (SDQ) (Goodman et al., 1998) in 5 studies (Chisholm et al., 2016; Dray et al., 2017; Pannebakker et al., 2019; Raval et al., 2019; Wigelsworth et al., 2012). PWBS (Ryff and Keyes, 1995) was used by Gigantesco et al. (2015). Kelley et al. (2021) used WEMWBS (Stewart-Brown et al., 2009). Anxiety and depression symptomatology was also measured using other instruments. Kirby et al. (2021) used GAD-7 (Spitzer et al., 2006) and SCAS (Spence, 1998). Lapshina et al. (2019) used DASS-21 (Lovibond and Lovibond, 1995) and MHC-SF (Keyes et al., 2008). Punukollu et al. (2020) used HADS (Zigmond and Snaith, 1983). Veltro et al. (2017) employed HBSC for health behaviors (HBSC-Italy, 2004). KINDL-R was used by Schwager et al. (2019). McMullen and McMullen (2018) employed AYPA (Betancourt et al., 2014).

Measure instruments for emotional resilience and self-efficacy were included in 9 studies. General Self-Efficacy scale (GSE) (Schwarzer and Jerusalem, 1995), was employed in three studies (McMullen and McMullen, 2018; Pannebakker et al., 2019; Schwager et al., 2019). Difficulties in Emotion Regulation Scale Short Form (DERS-SF) (Kaufman et al., 2016) was used in two studies (Green et al., 2021; Kirby et al., 2021). RESE (Caprara et al., 2008) was used by Gigantesco et al. (2015). Veltro et al. (2017) employed (APEN/G) e (AEP/G) (Caprara, 2004). Kirby et al. (2021) used ARQ-R (Gartland et al., 2011) and the How I Feel Scale (Walden et al., 2003). Moreover, Kirby et al. (2021) included MACS (Thorsteinsson et al., 2013). Chisholm et al. (2016) employed RE (Wagnild and Young, 1993). RYDM (California Department of Education, 2013) was used by Dray et al. (2017). RSCA (Thorne and Kohut, 2007), was utilized by Green et al. (2020). Punukollu et al. (2020) used their own developed scale, Causes of Distress, to measure emotional distress.

Other variables such as social integration/cohesion aspects were measured in 2 studies (McMullen and McMullen, 2019; Schwager et al., 2019). Moreover, measures
related to life satisfaction and optimism were included in two studies (Gigantesco et al., 2015; Veltro et al., 2017). Additionally, only one of the studies measured self-esteem (Pannebaker et al., 2019). Moreover, four studies assessed skill development related to the educational programs’ content using ad hoc measuring tools (Green et al., 2020; Kelley et al., 2021; Veltro et al., 2017; Wigelsworth et al., 2011).

Regarding learning outcomes, two of the selected studies (Chisholm et al., 2016; Green et al., 2021) assessed mental health knowledge.

**Mental health/wellbeing promotion outcomes**

Out of the 14 interventions, 12 were identified to be effective for promoting mental health. Five studies reported emotional wellbeing improvements (Chisholm et al., 2016; Gigantesco et al., 2015; Kelley et al., 2021; Raval et al., 2019). Six interventions demonstrated self-efficacy improvements (Gigantesco et al., 2015; Green et al., 2021; McMullen and McMullen, 2018; Pannebakker et al., 2019; Schwager et al., 2019; Veltro et al., 2017). Resilience enhancement was reported in four studies (Chisholm et al., 2016; Green et al., 2021; Kelley et al., 2021; Kirby et al., 2021). Four studies reported a decrease in mental health disorders symptomatology (Kirby et al., 2021; Lapshina et al., 2019; Pannebakker et al., 2019; Punukollu et al., 2020).

Other reported outcomes include: communication skills improvement in two studies (Green et al., 2021; Veltro et al., 2017), emotional distress/negative emotions reduction in two studies (Kirby et al., 2021; Punukollu et al., 2020), internalizing behavior in two studies (McMullen and McMullen, 2018; Raval et al., 2019), externalizing behavior in one study (Raval et al., 2019), increase in mental health knowledge in two studies (Chisholm et al., 2016; Green et al., 2021), stigma reduction and help-seeking attitude increase in one study (Chisholm et al., 2016), improvement in problem-solving skills in one study (Green et al., 2021), life satisfaction in one study (Gigantesco et al., 2015), goal definition in one study (Veltro et al., 2017), and class climate and social integration in one study (Schwager et al., 2019).

Five out of the six studies with an overall low risk of bias reported that their programs were effective. In addition, these studies agreed on some improvements: improvement in depressive symptoms (Lapshina et al., 2019; Pannebakker et al., 2019) and self-efficacy (Pannebakker et al., 2019; Schwager et al., 2019; Veltro et al., 2017). The remaining low-risk study found no program efficacy (Wigelsworth et al., 2012) on depressive symptoms.

Five studies with an overall unclear risk of bias concluded the efficacy of their assessed program. In these cases, improvements were observed in self-efficacy (Gigantesco et al., 2015; Green et al., 2021; McMullen and McMullen, 2018), internalizing problems (McMullen and McMullen, 2018; Raval et al., 2019), and emotional wellbeing (Gigantesco et al., 2015; Raval et al., 2019). The remaining unclear-risk study (Dray et al., 2017) reported no program efficacy on self-efficacy or improvement in depressive symptoms.
On the other hand, the three studies with a high risk of bias (Kelley et al., 2021; Kirby et al., 2021; Punukollu et al., 2020) claimed the efficacy of their programs and agreed on improvements in student resilience.

Every manualized intervention reported mental health improvements (Chisholm et al., 2016; Gigantesco et al., 2015; Green et al., 2021; Kelley et al., 2021; Kirby et al., 2021; Lapshina et al., 2019; McMullen and McMullen, 2018; Pannebakker et al., 2019; Punukollu et al., 2020; Raval et al., 2019; Veltro et al., 2017). Out of the three flexible implementation interventions (Dray et al., 2017; Schwager et al., 2019; Wigelsworth et al., 2012), one demonstrated mental health improvements (Schwager et al., 2019).

Out of 13 interventions including “resilience traits and skills”, 11 were reported as effective. Out of 11 interventions that targeted both social and emotional aspects, nine reported efficacy (Green et al., 2021; Kelley et al., 2021; Kirby et al., 2021; Lapshina et al., 2019; McMullen and McMullen, 2018; Pannebakker et al., 2019; Punukollu et al., 2020; Raval et al., 2019; Schwager et al., 2019). Programs including other problem solving, coping, or life skills reported improvements in seven of eight interventions (Gigantesco et al., 2015; Green et al., 2021; Kelley et al., 2021; McMullen and McMullen, 2018; Punukollu et al., 2020; Schwager et al., 2019; Veltro et al., 2017). Three of the four interventions involving self-esteem and self-efficacy as targets demonstrated positive outcomes (Pannebakker et al., 2019; Schwager et al., 2019; Veltro et al., 2017). Out of three educational programs involving life satisfaction and goal definition, two reported improvements (Kirby et al., 2021; Veltro et al., 2017).

Educational programs focusing on “mental health education” reported effectiveness in all five studies (Chisholm et al., 2016; Gigantesco et al., 2015; Kirby et al., 2021; Lapshina et al., 2019; Punukollu et al., 2020).

In addition to these findings, various effects related to age and mental health risk were reported. Two studies reported significant differences in outcomes depending on the adolescent’s age (Kirby et al., 2021; Veltro et al., 2017). Veltro et al. (2017) found greater efficacy for students aged 12–14 and a significant difference in favor of this age group, such as decreasing irrational beliefs. Nevertheless, more prominent effects on self-efficacy and healthy behavior were reported in adolescents aged 15–16 (Veltro et al., 2017). Kirby et al. (2021) reported better outcomes for students between ages 8–11 in anxiety scores and emotional self-regulation.

Differences in efficacy related to initial mental health conditions were reported in two studies (Lapshina et al., 2019; Raval et al., 2019). Both studies concluded that students at high risk of mental health concerns demonstrated the most significant differences between pre- and post-test measures.

Discussion

This literature review provides an appraisal of research evidence published over the last decade on preadolescent and adolescent educational mental health promotion delivered in school settings.
This systematic review aimed to examine possible contributions of school-based educational programs to the ongoing global youth mental health problem. Findings were characterized by their preliminary condition due to the limited evidence on educational programs consisting of pedagogical practices rather than therapeutic interventions. However, the outcomes of this review indicate possible contributions from education and current educational intervention foci. Moreover, school settings have been proven to be a suitable environment for the implementation/promotion of a wellbeing program that enables us to reach a universal youth population as previously reported (Durlak et al., 2011; Goldberg et al., 2019; O’Connor et al., 2018).

The primary finding of this review is that universal school-based mental health educational programs have positive effects on preadolescents and adolescents. Educational interventions improved students’ emotional wellbeing/mental health, symptomatology, self-efficacy, emotional resilience, coping skills, problem-solving skills, communication, internalizing and externalizing behavior, life satisfaction, goal definition, mental health knowledge, help-seeking behavior, class climate, and social integration (Chisholm et al., 2016; Gigantesco et al., 2015; Green et al., 2021; Kelley et al., 2021; Lapshina et al., 2019; McMullen and McMullen, 2018; Pannebakker et al., 2019; Punukollu et al., 2020; Raval et al., 2019; Schwager et al., 2019; Veltro et al., 2017). Nevertheless, two studies reported that the program had no effects on wellbeing or emotional resilience (Dray et al., 2017; Wigelsworth et al., 2012).

Educational programs included in the reviewed studies demonstrated their contribution to adolescent wellbeing improvement through two different educational functions. These contributions were accomplished via educational foci involved in wellbeing promotion. Mental health promotion programs assessment generated two primary educational focuses: mental health education and resilience traits and skills.

This review established that school education can support healthcare through mental health education. Programs including the educational focus point “mental health education” included learning on mental health literacy, mental health awareness, anti-stigma education, and help-seeking behavior. Through these targets, education raises wellbeing awareness, teaches the early detection of mental health problems, facilitates information, and supports early access to mental health services. Moreover, destigmatizing education reduces mental health stigma barriers and increases help-seeking behavior. The success of this intervention is demonstrated by an increase in help-seeking attitude, a decrease in stigma attitudes, and an increase in mental health knowledge. Nevertheless, results of this review indicate that these interventions improved wellbeing, even in the Chisholm et al. (2016) program in which “mental health literacy” was the only educational focus, implying that mental health education may also be related to mental health improvement in some way (Chisholm et al., 2016). The outcomes of these programs imply that education can significantly contribute to issues related to worldwide adolescent mental health by reaching students through universal school-based mental health intervention.
A secondary function that a school could carry out is to develop resilience and personal skills through education. Programs including the educational focus point “resilience traits and skills” demonstrate that emotional resilience is buildable in adolescents, and therefore, students’ mental wellbeing can be improved by promoting its acquisition. Reviewed studies proved that universal school-based educational programs could contribute to the improvement of emotional wellbeing by developing self-efficacy, self-esteem, social and emotional aspects, problem-solving skills, internalizing and externalizing problems, communication, and life satisfaction.

While research indicates that adolescent and preadolescent resiliency skills can be improved throughout this stage of life, Veltro et al. (2017) found particularly different outcomes depending on the adolescents’ age. More significant functional beliefs and life satisfaction outcomes were reported for early adolescents (12–14 years) in comparison to late adolescents (15–16 years). On the other hand, attributes such as self-efficacy and negative emotion management demonstrated greater improvements for adolescents over the age of 14 (Veltro et al., 2017). On the contrary, Kirby et al. (2021) found better emotion management in younger students aged 8–11 than those aged 12–14. Nevertheless, these findings have been compromised due to small-sample sizing and high-risk bias, as students volunteered to participate in the program. Different age-related outcomes might imply that developmental stages have an essential role in resilience skills and attribute building. Such age comparison findings could enable the design of educational programs sensitive to the cognitive development and maturation rate of adolescents.

Educational mental health promotion programs also showed different effects depending on the risk for students to develop mental health difficulties (Lapshina et al., 2019; Punukollu et al., 2020). However, Punukollu et al. (2020)’s outcomes were compromised due to incomplete outcome data. These findings suggest that universal programs can have more significant beneficial effects on those students at risk—those who most need them—while also benefitting all students. These preliminary outcomes indicate the high potential of universal school-based interventions in addressing every student’s healthy development needs.

Moreover, manualized interventions with structured and sequenced lessons have demonstrated better results than flexible interventions with non-sequential lessons. This preliminary finding carefully denotes designed didactic planning, and content sequencing seems critical for successful mental health promotion educational interventions. Development of some skills might need activities and content coordination and specific order for learning, according to (Durlak et al., 2011).

Multicomponent programs have demonstrated less efficacy than single-component programs. However, three out of four of the interventions with components other than curricula were also adaptable in terms of implementation. This circumstance made it difficult for an effective assessment, as the structure on which interventions have been implemented have influenced efficacy (Durlak et al., 2011), and another
review on multicomponent interventions concluded this as well (Goldberg et al., 2019). Due to uncertainty, conclusions about the effectiveness based on program components cannot be enunciated.

Previous universal school-based mental health promotion intervention reviewed by O’Connor et al. (2017) indicated the disparity in dependent variables and their gauging mechanisms in this field and its consequent difficulty in comparing results from different types of intervention. Due to this problem, this review pays special attention to it. Overall wellbeing was identified as the primary outcome variable, which was assessed predominantly using the SDQ (Goodman et al., 1998) and alternatively measured using other wellbeing scales. In addition, self-efficacy and emotion regulation, as wellbeing mediators, are measured in the majority of studies. The most frequently used instruments were the GSE (Schwarzer and Jerusalem, 1995) scale and DERS-SF (Kaufman et al., 2016). Despite the wide variety of gauging mechanisms and dependent variables, these similarities shed some light on/into the capacity to measure the variable.

Strengths and limitations
The inclusion of diverse design studies has enabled the understanding of existing evidence. Therefore, this study provides an overview of the current state of promoting and intervening in wellbeing awareness over the last decade. However, high risks of biases present in some studies (Kelley et al., 2021; Kirby et al., 2021; Punukollu et al., 2020) must be considered when interpreting the results.

A critical limitation of this study is that the coding process was done by only one researcher. This method implies that there are no data on possible coding disagreements, and intercoder reliability was not calculated.

Additionally, the findings of this review should be interpreted with caution due to the limited number of studies assessed. The incipient state of this discipline is characterized by few studies about educational school-based universal mental health promotion programs. Most school-based programs include therapeutic techniques and are not suitable for being implemented by pedagogues or educators in everyday school settings. This circumstance not only represents a research limitation but also confers added value to this study, as mental health promotion research with a pedagogical approach is rare.

Additionally, another considerable limitation was identified because the included studies did not always choose the same outcome variables. This circumstance complicates the comparison between programs. Therefore, the included studies’ results were assessed regarding their authors’ conclusions on effectiveness and the variables that have been measured and showed improvement according to the study’s authors.

Another limitation found in this review was that most of the assessed interventions were single-component interventions that only implemented class-based curricula and activities. From this limitation emerges a future research direction on the
effectiveness and adequacy of mental health didactic methods and diverse pedagogical practices.

Certain educational aspects of mental health promotion remain unexplored. To address the research questions that arise in this review, future research on mental health promotion through education must assess the influence of variables such as age or previous mental health risks. Findings regarding influent variables are essential to ensuring that educational interventions are beneficial for everyone and address the needs of all students.

Conclusion
This systematic review found evidence of the positive effects of universal school-based mental health educational programs on preadolescents and adolescents. Moreover, it provides further insight into each program and has been able to identify two primary curricula foci: mental health education and the development of resiliency traits and skills. Despite the study’s limitations, the findings have some practical implications. Most appropriate interventions for adolescent wellbeing improvement comprise manual-based sequenced learning curricula targeting focus points, and such implementation should begin before the crucial age of 14, as an early start increases efficacy on resiliency development.

Moreover, this paper demonstrates that school is a suitable environment for mental health promotion and that education can play a vital role in contributing to the development of mental health among students. As adolescents worldwide experience higher rates of depression, anxiety, and stress post COVID-19 pandemic (Jones et al., 2021), this study’s findings encourage the global education community to address the adolescent mental health crisis and prevent its future consequences by implementing educational curricula that promote the wellbeing of younger generations and increase the society’s likelihood of fulfilling lives as adults.

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PRISMA chart describing search and inclusion procedures

508x285mm (96 x 96 DPI)
| Study | N   | Sample Age (years) | Design | Method          | Comparison groups                                                                 | Efficacy                                      |
|-------|-----|--------------------|--------|-----------------|---------------------------------------------------------------------------------|-----------------------------------------------|
| [1]   | 924 | 12-13              | CRCT   | Mixed methods   | T1: Education T2: Education and intergroup contact                              | Effective No significant differences between treatments |
| [2]   | 2105| 12-16              | CRCT   | Quantitative    | T1 Control                                                                      | Ineffective Small significant difference in favor of control |
| [3]   | 391 | 14-18              | CRCT   | Quantitative    | T1 Control                                                                      | Effective                                      |
| [4]   | 357 | 10-13              | CRCT   | Quantitative    | T1 Control                                                                      | Effective                                      |
| [5]   | 205 | 11-15              | NEGD   | Mixed methods   | T1 Control                                                                      | Effective                                      |
| [6]   | 88  | 8-14               | NEGD   | Mixed methods   | N1: Primary School N2: Secondary School                                         | Effective Greater effect for N1               |
| [7]   | 722 | 11-21              | Pre-Post | Quantitative    | T1                                                                               | Effective for students with high depression scores |
| [8]   | 170 | 13-18              | Cluster Controlled | Quantitative    | T1 Control                                                                      | Effective                                      |
| [9]   | 995 | 13-16              | CRCT   | Quantitative    | T1 Control                                                                      | Effective                                      |
| [10]  | 367 | 11-17              | Pre-Post | Mixed methods   | T1                                                                               | Effective                                      |
| [11]  | 185 | 9-11               | Pre-Post | Quantitative    | T1                                                                               | Effective Greater effect for high risk students |
| [12]  | 912 | 10-17              | Cluster Controlled Parallelized | Mixed methods   | T1 Control                                                                      | Effective                                      |
| [13]  | 113 | 12-17              | NEGD   | Quantitative    | N1: Middle School N2: High School                                              | Effective Significant difference in favor of N1 (IB) Significant difference in favor of N2 (SEf, HB) |
| [14]  | 4506| 11-12              | Cluster Controlled Parallelized | Quantitative    | T1 Control                                                                      | Ineffective                                    |
CRCT: Cluster randomized controlled trial; NEGD: Non-equivalent groups design; Pre-Post: Pretest-posttest design; T1: Treatment one; T2: Treatment two; N1: Comparison condition 1; N2: Comparison condition; IB: Irrational beliefs; SEf: Self-efficacy; HB: Healthy behaviors.
| Study | Focuses                                      | Duration | Structure | Components                        | Measure Instrument | Improvement          |
|-------|---------------------------------------------|----------|-----------|-----------------------------------|--------------------|----------------------|
| [1]   | MH Literacy                                 | 1 day    | Manualized| Curricula                         | SDQ, RS, RIBS, MAKS| EW                   |
|       | MH Stigma                                   |          |           |                                   |                    | Resilience           |
|       | HS                                          |          |           |                                   |                    | Stigma               |
| [2]   | Resilience                                  | 18h      | Flexible  | Curricula                         | SDQ, RWDM          | No                   |
|       | SEF Communication                           |          |           |                                   |                    |                      |
|       | PS                                          |          |           |                                   |                    |                      |
|       | Goal Definition                             |          |           |                                   |                    |                      |
| [3]   | MH Literacy                                 | 20 lessons| Manualized| Curricula                         | PWBS, RESE, SWLS  | EW                   |
|       | MH Stigma                                   | 60mins   |           |                                   |                    | SEf                  |
|       | PS                                          |          |           |                                   |                    | Life satisfaction    |
| [4]   | SEL Communication                           | 12 lessons| Manualized| Curricula                         | DERS-SF, RSCA, CDP, 3PI| SEf                  |
|       | PS                                          | 60mins   |           |                                   |                    | Resilience           |
|       | Goal Definition                             |          |           |                                   |                    | PS Skills            |
|       |                                                 |          |           |                                   |                    | Communication        |
|       |                                                 |          |           |                                   |                    | MH Knowledge         |
| [5]   | SEL Resilience                              | 10 lessons| Manualized| Curricula                         | WEMWBS, I-ORQ     | EW                   |
|       |                                             | 50mins   |           |                                   |                    | Resilience           |
| [6]   | SEL MH Literacy                             | 16 lessons| Manualized| Curricula                         | DERS-SF, ARQ-R, GAD-7, SCAS, HIFS, MACS | Resilience |
|       | Hope                                        | 45mins   |           |                                   |                    | Anxiety              |
|       |                                              |          |           |                                   |                    | Negative Emotions    |
|       |                                              |          |           |                                   |                    | Coping Skills        |
| [7]   | SEL Communication                           | 36 weeks | Manualized| Curricula                         | MHC-SF, DASS-21   | MH                   |
|       | Help Seeking                                |          |           |                                   |                    | Depressive Symptoms  |
|       | Risk Behaviors                              |          |           |                                   |                    |                      |
| [8]   | MH LS                                      | 24 lessons| Manualized| Curricula                         | GSE, AYPA, MAC-5  | SEf                  |
|       | Social cohesion                             | 45-60mins|           |                                   |                    | IP                   |
| [9]   | SEs SEF                                     | 17 sessions| Manualized| Curricula                         | SDQ, GSE, RSE, BDI | Depressive Symptoms  |
|       | Social Skills                               | 60mins   |           |                                   |                    | SEf                  |
| [10]  | MH Awareness Peer support                   | 24 weeks | Manualized| Curricula, Peer net, Mobile App   | HADS, COD          | Symptomatology       |
|       | Coping Skills                               |          |           |                                   |                    | Emotional distress   |
|       |                                              |          |           |                                   |                    | HS                   |
| [11]  | SEL                                         | 12 weeks | Manualized| W-SA                               | SDQ                | EW                   |
|       |                                              |          |           |                                   |                    | IP                   |
| [12]  | SEs LS                                      | 15 lessons| Flexible  | Curricula, Exposition              | GSE, KINDL-R, LQSCC| SEf                  |
|       | Emotional Ed.                               | 10-15mins|           |                                   |                    | Class climate        |
|       | SI Scale                                                                 |       |        |       |
|-------|--------------------------------------------------------------------------|-------|--------|-------|
| [13]  | PS                                                                       | LS    | SEf    | 20 lessons | 60mins | Manualized Curricula | HBSC | APEP/G | APEN/G | LAQ | Idea Inventory | SEf | Communication | Goal Definition |
| [14]  | SEL                                                                      | 6 lessons | 20mins | Flexible | W-SA | SDQ | ELAI | No |

MH: Mental Health, HS: Help Seeking, EW: Emotional Wellbeing, SEL: Social and Emotional Learning, PS: Problem Solving, LS: Life Skills, SEf: Self-efficacy, SEs: Self-esteem, W-SA: Whole-School Approach, SI: Social Integration, IP: Internalizing Problems, EP: Externalizing Problems.
| Study              | D1 | D2 | D3 | D4 | D5 | D6 | D7 | Overall |
|-------------------|----|----|----|----|----|----|----|---------|
| Chisholm 2016     | +  | -  | +  | +  | +  | +  | +  | +       |
| Dray 2017         | +  | -  | +  | +  | +  | -  | -  | -       |
| Gigantesco 2015   | -  | -  | +  | +  | +  | +  | -  | -       |
| Green 2021        | -  | -  | +  | +  | +  | +  | -  | -       |
| Kelley 2021       | -  | -  | +  | -  | -  | -  | -  | -       |
| Kirby 2021        | -  | -  | -  | +  | +  | -  | -  | -       |
| Lapshina 2019     | -  | -  | +  | +  | +  | +  | +  | +       |
| McMullen 2018     | -  | -  | +  | +  | -  | +  | -  | -       |
| Pannebakker 2019  | -  | -  | +  | -  | +  | +  | +  | +       |
| Punukollu 2020    | -  | -  | +  | +  | -  | +  | -  | -       |
| Raval 2019        | -  | -  | +  | -  | +  | -  | -  | -       |
| Schwager 2018     | -  | -  | +  | +  | +  | +  | +  | +       |
| Veitro 2017       | -  | -  | +  | +  | +  | +  | +  | +       |
| Wigelsworth 2011  | -  | -  | +  | +  | +  | +  | +  | +       |

D1: Random sequence generation  
D2: Allocation concealment  
D3: Blinding of participants and personnel  
D4: Blinding of outcome assessment  
D5: Incomplete outcome data  
D6: Selective reporting  
D7: Other sources of bias

Judgement  
High: Red  
Unclear: Yellow  
Low: Green

Risk of bias summary table

210x297mm (171 x 171 DPI)
Risk of bias summary graphics

158x52mm (96 x 96 DPI)
Records identified from:
- Databases (n = 801)
  - ERIC n = 252
  - PubMed n = 83
  - Education DataBase n = 134
  - APA PsycInfo n = 167
  - APA PsycArticles n = 19
  - Psychology Database n = 146

Records removed before screening:
- Duplicate records removed (n = 336)

Records screened (n = 465)

Records excluded (n = 392)
- Not adolescent sample (n = 12)
- Therapeutic intervention (n = 15)
- Not universal intervention (n = 3)
- Not school-based (n = 9)
- Not related to wellbeing (n = 3)
- Outcomes are not measured (n = 2)
- Implementation article (n = 9)

Reports sought for retrieval (n = 73)

Reports not retrieved (n = 8)

Reports assessed for eligibility (n = 65)

Studies included in review (n = 14)
- Reports of included studies (n = 14)

Records identified from:
- Previous searches (n = 8)
- Citation searching (n = 44)

Reports sought for retrieval (n = 24)

Reports not retrieved (n = 4)

Reports assessed for eligibility (n = 20)

Reports excluded:
- Not adolescent sample (n = 7)
- Therapeutic intervention (n = 1)
- Not related to wellbeing (n = 3)
- Implementation article (n = 5)
| Study                | D1 | D2 | D3 | D4 | D5 | D6 | D7 | Overall |
|---------------------|----|----|----|----|----|----|----|---------|
| Chisholm 2016       | +  | -  | +  | +  | +  | -  | +  | +       |
| Dray 2017           | +  | -  | +  | +  | +  | +  | -  | -       |
| Gigantesco 2015     | -  | -  | +  | +  | +  | +  | -  | -       |
| Green 2021          | -  | -  | +  | +  | +  | +  | -  | -       |
| Kelley 2021         | x  | -  | +  | -  | -  | -  | x  | x       |
| Kirby 2021          | x  | -  | -  | +  | x  | -  | x  | x       |
| Lapshina 2019       | x  | -  | +  | +  | +  | +  | +  | +       |
| McMullen 2018       | x  | -  | +  | +  | -  | +  | +  | -       |
| Pannebakker 2019    | -  | -  | +  | -  | +  | +  | +  | +       |
| Punukollu 2020      | x  | -  | +  | x  | +  | -  | +  | x       |
| Raval 2019          | x  | -  | +  | -  | +  | +  | +  | -       |
| Schwager 2018       | x  | -  | +  | +  | +  | +  | +  | +       |
| Veltro 2017         | x  | -  | +  | +  | +  | +  | +  | +       |
| Wigelsworth 2011    | x  | -  | +  | +  | +  | +  | +  | +       |

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D5: Incomplete outcome data
D6: Selective reporting
D7: Other sources of bias

Judgement
- High
- Unclear
- Low