Socioemotional Learning in Physical Education, a systematic review in Secondary School

Aprendizaje Socioemocional en Educación Física: una revisión sistemática en Educación Secundaria

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Abstract

Introduction: Current epidemiological studies highlight the severity of mental health problems in adolescents. The role of education as a coping strategy and as a need for comprehensive education is determinant, however, it has received little scientific attention.
Objective: To review research with educational interventions for the development of social and emotional competences in physical education in secondary education (11-18 years old) in order to know its current status.
Methodology: The quality of the studies, the pedagogical models underpinning the interventions and their content and evaluation instruments were analysed. The search was carried out from 2013 to March 2024 in the Web of Science and PubMed databases using the PRISMA method, excluding studies with an exclusively qualitative design.
Results: The number of included studies was 11. The analysis indicated a low level of study quality and a great diversity of educational models, measurement instruments, variables to be studied and types of intervention. All studies indicated improvements in participants' social-emotional competencies. Sport education, social emotional and social responsibility and cooperative learning models, as well as problem-solving activities, were the most effective interventions.
Conclusions: The development of this line of research requires following the quality criteria analysed in this study and include greater depth in the description and evaluation of the fidelity of globalised interventions that develop the five key social-emotional competencies.

Keywords

Adolescence; affective education; socio-emotional education; assessment of fidelity; educational models.

Resumen

Introducción: Los estudios epidemiológicos actuales destacan la gravedad de los problemas de salud mental en adolescentes. El papel de la educación como estrategia de afrontamiento y como necesidad de la educación integral es determinante, sin embargo, ha recibido poca atención científica.
Objetivo: Revisar las investigaciones con intervenciones educativas para el desarrollo de competencias sociales y emocionales en educación física en educación secundaria (11-18 años) para conocer su estado actual.
Metodología: Se analizaron la calidad de los estudios, los modelos pedagógicos que fundamentan las intervenciones y sus contenidos e instrumentos de evaluación. Se realizó la búsqueda desde 2013 hasta marzo de 2024 en las bases de datos de Web of Science y PubMed utilizando el método PRISMA, excluyendo los estudios con diseño exclusivamente cualitativo.
Resultados: El número de estudios incluidos fue de 11. El análisis indicó un bajo nivel de calidad de los estudios y una gran diversidad de modelos educativos, instrumentos de medida, variables a estudiar y tipos de intervención. Todos los estudios indicaron mejoras en las competencias socioemocionales de los participantes. Los modelos de educación deportiva, responsabilidad emocional y social y aprendizaje cooperativo, así como actividades de resolución de problemas, fueron las intervenciones más eficaces.
Conclusiones: El desarrollo de esta línea de investigación requiere seguir los criterios de calidad analizados en este estudio e incluir mayor profundidad en la descripción y evaluación de la fidelización de las de intervenciones globalizadas que desarrollen las cinco competencias socioemocionales fundamentales.

Palabras clave

Adolescencia; educación afectiva; educación socioemocional; evaluación de la fidelización; modelos educativos.

Introduction

Mental health can be understood as the dynamic state that allows individuals to use their cognitive and social abilities in harmony with societal values, acknowledging, expressing, and regulating both internal and external emotions, as well as coping with adversities and fulfilling social roles (Galderisi et al., 2015). During adolescence, a stage marked by significant biological, psychological, and social transformations (Pineda-Pérez & Aliño-Santiago, 2002), young people are vulnerable to mental health problems (Casañas & Lalucat, 2018), with depressive disorders being one of the leading six causes of disability (Vos et al., 2020). The COVID-19 pandemic and associated global lockdown measures have worsened this situation (Hossain et al., 2022), raising our awareness of this issue.

Teaching physical and emotional skills contributes to the holistic development of individuals, equipping them with resources to tackle present-day challenges more effectively (Biddle et al., 2019). Physical activity and Physical Education (PE) have emerged as important alternatives for addressing this issue (Opstoel et al., 2020; Soldevila-Matías et al., 2024).

Although evidence on the positive effects of physical activity on mental health has evolved from being considered modest (Biddle et al., 2011) to partial (Biddle et al., 2019), there is still no conclusive evidence regarding the specific role of PE (Andermo et al., 2020). Current studies on physical activity and health suggest improvements in resilience, anxiety regulation, well-being, and positive mental health, as well as enhanced academic performance and more positive attitudes (Bartlett, 2019; Bridgeland et al., 2013; Burgueño & Medina-Casaubón, 2020; Dyson et al., 2020; Opstoel et al., 2020).

School-based mental health intervention programmes, such as social-emotional learning (SEL) initiatives, have gained traction, although a consensus on their definition is lacking (McKwon, 2017). SEL refers to interventions that help students understand and manage emotions, solve problems constructively, and maintain positive social relationships (Barney et al., 2022; Durlak et al., 2011). The Collaborative for Academic, Social, and Emotional Learning (CASEL) is an intervention programme addressing social-emotional education through five interrelated competencies: self-awareness, self-management, social awareness, relationship skills, and responsible decision-making (CASEL, 2024). This programme, based on theories of social and emotional development, behavioural change, and collaborative community action research (Osher, 2016), presents challenges in interpretation and implementation, especially in the PE context (Dyson et al., 2020).

In the past decade, several educational meta-analyses have supported the implementation of SEL programmes using evidence-based interventions to promote positive academic, behavioural, and developmental growth in youth through the development of social-emotional competencies (Corcoran et al., 2018; Durlak et al., 2011). Recent research has focused on teachers' roles and students' behaviours and perceptions regarding SEL (Wright & Richards, 2021; Opstoel et al., 2020). In PE, review studies recognise SEL as a critical component in the development of comprehensive programmes (Bartlett, 2019; Dyson et al., 2020; Opstoel et al., 2020). Improvements in social responsibility and emotional intelligence have been demonstrated at the primary education level through models like personal and social responsibility, cooperative learning, and the MindUp programme (Escartí et al., 2010; Pozo-Rosado et al., 2022; Rivera-Pérez et al., 2021). SEL via physical activity has shown effectiveness in reducing verbal aggression through physical activities and active breaks that use games as tools to resolve problems and conflicts (Mayfield et al., 2017), controlling impulsivity (Ghahremani et al., 2013), reducing negative affect (Luna et al., 2019), and diminishing physical aggression through disciplines like martial arts and combat sports (Simões et al., 2021). SEL has also improved emotional recognition, control, regulation, and empathy (Rivera-Pérez et al., 2020). Furthermore, SEL has enhanced attention and reduced anxiety in activities requiring concentration, self-control, and focus, such as breathing exercises and sensory-perceptive activities (Napoli et al., 2005), as well as practices like yoga and Pilates (Mesa et al., 2023).

Despite the significant increase in socioemotional and mental health problems in adolescence (Merikangas et al., 2009; Rapee et al., 2019), research on SEL in education is still scarce (Yeager, 2017) and of lesser depth in PE in secondary education (Dyson et al., 2020). In order to know the current state of SEL in PE, this study proposes a systematic review of the scientific literature that analyses educational interventions on socioemotional learning in PE in secondary and high school, examining theoretical models, intervention design, content worked on, teacher training, time dedicated to development and

evaluation instruments, as well as the most relevant results, all with the aim of establishing where we are and marking future lines of research that improve education and health in Secondary Education.

Method

The review was conducted using the standardised PRISMA model (Page et al., 2021). The information search involved various stages: selecting databases, formulating descriptors for searches and their interaction (search equation), designing inclusion and exclusion criteria, and finally, analysing the information obtained.

Inclusion Criteria

The analysed studies had to meet the following criteria: (1) any type of document except systematic reviews, books, editorials, or letters to the editor; (2) be located in databases operated by Web of Science or PubMed; (3) be published between January 2013 and March 2024; (4) have full-text access; (5) be written in English or Spanish; (6) involve a study sample aged between 11 and 18 years; (7) be set within the context of the PE subject. This review excluded studies that did not meet the inclusion criteria and those that lacked teaching methods for implementing social and/or emotional learning, or had no study designs with quantitative results, as qualitative literature primarily focuses on student or teacher perceptions, which is beyond the scope of our review.

Descriptors Used

To select the keywords for the review, along with synonyms and related concepts, the DeCS thesaurus (health sciences descriptors) was used. The basic search descriptors were: (1) social emotional learning; (2) social skills; (3) emotional intelligence; (4) adolescent; and (5) physical education. Search equations can be found in Supplementary Material I.

Search Strategy

The Boolean operators AND and OR were used, along with truncation (*) to locate terms derived from root words. Due to the different functions of search engines (PubMed allows searches through title/abstract, while WOS works via 'Topic'), the search equations were different (Supplementary Material I).

Data Analysis

Data extraction began with the search equations. Then, two researchers independently reviewed the titles and abstracts of the articles to ensure they met the inclusion and exclusion criteria. The results of the selection were discussed in a joint meeting. If there was no agreement, the title and abstract were reread jointly, and in cases of insufficient information or disagreement, the full article was read together.

Quality Assessment

To determine the quality criteria met by the selected studies, the requirements established by Lander et al. (2016) were followed, based on the standardised process of 'Consolidated standards of reporting trials statements', as well as the PRISMA recommendations. Criteria analysed included sample randomisation and study group assignment, study design, use of validated instruments, blind analysis, inclusion and exclusion of participants in the analysis, consideration of covariates, power calculation, results presentation, and ethical aspects.

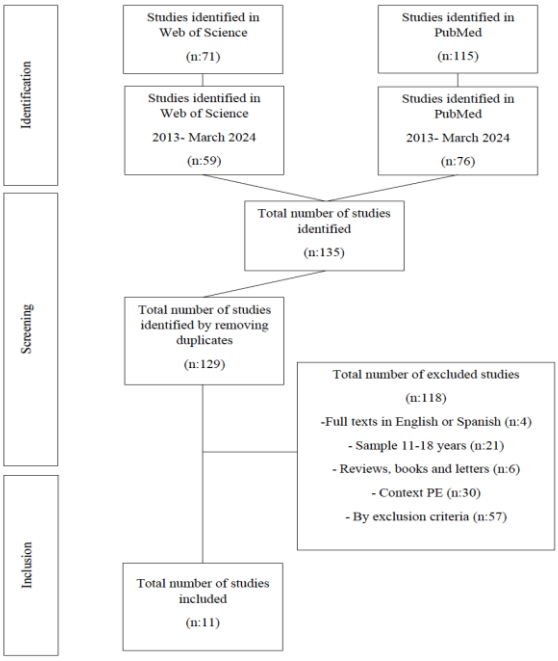
Factors analysed

For the study of the articles, descriptive information related to the journal, country of application of the study, sample, gender and age, study design and time of application was retrieved. To carry out a more detailed analysis of the interventions, information was included on the training of the teachers who implemented them, professional experience, selection criteria, distribution in the different groups, training received, fidelity of implementation and methodologies used for their evaluation. In addition, information was collected on the theoretical frameworks of reference, instruments used, and characteristics, validation processes, duration of the intervention, type of intervention and most relevant results.

Results

The search yielded a total of 129 articles, of which 11 studies were selected after the screening process. The PRISMA flow diagram is shown in Figure 1.

Figure 1. PRISMA flow diagram



Source: Own elaboration

Quality Criteria

Out of the 10 criteria analysed, the results (Supplementary Material II) indicated a low quality level among the studies. None of the studies achieved 70% of the criteria, with an average compliance rate of 35%. Most trials followed procedures approved by ethics committees (99.9%; n=10). A total of 54.6% (n=6) randomly assigned participants to experimental and control groups. Additionally, only 27.3% excluded participants who did not meet inclusion criteria (n=3), and in only one study (9.1%) was participant dropout reported. Meanwhile, 54.6% of the studies provided validation data for the instruments used (n=6), and 27.3% considered covariates for analysis (n=3). No studies included blind result evaluation or power calculation, and only 27.3% presented summaries of these (n=3).

General Characteristics of the Studies

The full analysis (Supplementary Material III) showed that 81.8% of the selected studies were conducted in Spain, with the remaining studies (n=2; 18.2%) conducted in the United States of America. The journals where the articles were published were primarily multidisciplinary (64.6%), with the International Journal of Environment Research and Public Health being the journal with the most publications on this topic (n=5), while only four journals had a specific focus on PE.

Regarding sample characteristics, the total number of participants comprised 51.8% males and 48.2% females. The age range in the studies varied from 11 to 14 years and from 13 to 18 years. A total of 63.6% of the studies (n=7) involved participants aged 16, marking the end of secondary education, while the remaining 36.36% included both secondary and upper secondary education students (n=4).

Research Design

Of the total studies, 90.91% used quantitative designs (n=10), while 9.09% utilised mixed-method designs (n=1). Of the quantitative studies, 80% employed quasi-experimental designs (n=8) and 20% non-experimental designs (n=2).

Student Evaluation Instruments

The analysis of evaluation instruments considered the type of instrument, characteristics, and psychometric properties (Supplementary Material IV). A total of 21 different validated instruments were used, some of which were validated in previous studies. Although most studies evaluated both social and emotional components using various instruments, five studies used only one instrument (Ghahremani et al., 2013; Hinojo-Lucena et al., 2019; Burgueño & Medina-Casaubón, 2020; Casado-Robles et al., 2022; Jacobs et al., 2022). The Trait Meta-Mood Scale, which measures emotional control (Fernández-Berrocal et al., 2004), was the only instrument used in two studies (González et al., 2019; Luna et al., 2019).

In terms of the instruments, two main categories were detected. Ten instruments assessed social learning and 12 assessed emotional learning. Although most studies analysed both components by means of several instruments, in some cases only one instrument was used to measure them (Jacobs et al.,2022).

Based on the use of the instruments, four designs were obtained. The research by Hinojo-Lucena et al. (2019) and Rivera-Pérez et al. (2020) conducted ex-post-facto studies, applying only one post-test. Most studies applied pre-test and post-test (72.73%; n=8) (Ghahremani et al., 2013; González et al., 2019; Luna et al., 2019; Burgueño & Medina-Casaubón, 2020; Manzano-Sánchez et al., 2021; Constantino-Murillo & Espada-Mateos, 2021; Casado-Robles et al., 2022; Jacobs et al., 2022). Finally, the research by Rillo-Albert et al. (2021) conducted pre-, during and post-intervention assessments (9.09%; n=1).

Educational models and types of intervention

The educational models used in the studies for the development of interventions with more recognition were the Sport Education Model (Siedentop et al., 2011), the Social and Personal Responsibility Model (Hellison, 2011), Cooperative Learning Model (Johnson & Johnson, 2009). Other models were used such as the GIAM Model, based on the Theory of Motor Action (Parlebás, 2001) and some interventions without a clear theoretical basis, such as expressive activities or flipped learning (Supplementary Material V).

The general results on the types of intervention, number of sessions and elements worked on (Supplementary Material VI) presented the following characteristics.

In relation to the types of intervention, the vast majority implemented didactic units (n=8). To a lesser extent, other types of interventions (annual programming and workshops) were used (n=2). The study by Rivera-Pérez et al. (2020) did not specify. The interventions were oriented towards sports activities (n=4), expressive activities (n=2), varied activities (n=2), pre-sports games (n=1) and audiovisual activities (n=1). The level of concreteness in the description of the interventions was very low, the general type of activities is mentioned (n=9) and in some cases the distribution of these in the different sessions (n=4) and there is no information on the general principles and teaching strategies for the development of the interventions.

Regarding the number of sessions, we found four categories. The first one, made up of interventions of up to a maximum of 5 sessions (n=2). The second, made up of interventions between 6 and 10 sessions (n=1). The third, with interventions from 11 to 15 sessions (n=2). And the fourth, with those between 16 and 20 sessions (n=3). Finally, we found research that did not specify the number of sessions (n=3).

They can be grouped into two broad categories: social learning (17 items) and emotional learning (21 items) (Supplementary Material VI).

Teacher training

The selection of teachers was always intentional, based on interest in their skills and links to the schools in which the study took place (Supplementary Material VII). Six of the eleven studies do not report on the participating teachers and the information on their preparation is very limited, number of sessions, duration and general organisation of the sessions. Only two studies (Luna et al., 2019; Manzano-Sánchez et al., 2021) include in the training a follow-up through observations of the implementation of the interventions.

Fidelity of intervention programmes

The results of these studies on fidelisation (Supplementary Material V) show that only two (Manzano-Sánchez et al., 2021, Jacobs et al., 2022) of the eleven included studies evaluate intervention

implementation using validated observational methods such as TARE (Tool for Assessing Responsibility-Based Education). Only Jacobs et al. (2022) specify the training of the observer who is to evaluate them, the other does not specify any training, but includes 4 observers (Manzano-Sánchez et al, 2021). Two other studies explain that training is monitored, but no results are provided (Luna et al. 2019; Burgueño & Medina-Casaubón, 2020).

Results of the interventions

The results of all studies indicated a positive effect of the interventions developed on the social and emotional dimensions of the students (Supplementary Material VI).

Studies that investigated the impact of specific interventions on emotional regulation provided relevant information on their effect. Ghahremani et al. (2013), observed a significant post-intervention reduction of impulsivity in the experimental group ($p = .03$), while the control group maintained its level. Luna et al. (2019) reported significant post-intervention differences between intervention conditions ($p = .003$), with a significant decrease in negative affect score ($p = .01$) and a significant improvement in emotional intelligence ($p < .001$).

In terms of social behaviour, the studies analysed also provided positive results in this dimension. González et al. (2019), although they observed that the experimental group significantly decreased prosocial reasoning and emotional intelligence associated with repairing negative emotions ($p < .01$), described a significant increase in prosocial behaviours ($p < .01$). Burgueño & Medina-Casaubón (2020) found significant changes in favour of respect for norms, opponents and social conventions in the experimental group ($p < .001$). Manzano-Sánchez et al. (2021) found significant changes in the experimental group regarding the increase of prosocial behaviours ($p < .05$). Casado-Robles et al. (2022) described increases in positive nominations ($p < .001$) and decreases in negative nominations ($p < .001$).

In relation to the development of social and emotional skills, Constantino-Murillo and Espada-Mateos (2021) found significant improvements in emotional clarity and emotion repair ($p < .05$). Rillo-Albert et al. (2021) found a significant decrease in both negative emotions ($p = .047$) and conflicts with peers ($p = .004$) and adversaries ($p < .001$). Jacobs et al. (2022) reported that the experimental group significantly improved in speaking, asking for help and encouragement to others ($p < .001$), while the control group significantly improved in encouragement to others and speaking ($p < .001$).

Studies on the use of audiovisual resources and cooperative methodologies showed improvements in the social and emotional dimension of the participants. Hinojo-Lucena et al. (2019) showed that the use of audiovisual resources, such as flipped learning, increases the interactive (social) dimension to a greater extent than traditional methodologies ($p < .001$). Rivera-Pérez et al. (2020) found that classes with higher levels of cooperative learning have significantly higher values in items related to emotional learning ($p < .001$).

Discussion

At present, adolescent mental health is a major public health issue (Kieling et al., 2024). Political and research initiatives highlight schools as having great potential for developing and implementing SEL programmes, given their demonstrated effectiveness in enhancing adolescent mental health (Bartlett, 2019). These programmes help individuals manage and understand their emotions, as well as maintain positive social relationships (Zins, 2004). To our knowledge, this is the first study reviewing SEL studies in PE for the adolescent population. The overall results of this review, similar to previous reviews (Opstoel et al., 2020), indicate that all interventions showed improvements in participants' social and/or emotional skills within PE. The development of these social-emotional skills, traditionally studied in subjects like mathematics, language, or science (Jones & Doolittle, 2017; Corcoran et al., 2018), is also confirmed within PE, demonstrating its potential for implementing SEL programmes. However, the limited number of studies found points to the need for further research to implement these programmes across all curricular content in PE and integrate them with other subjects.

The previous review by Opstoel et al. (2020), with broader inclusion criteria, analysed up to 88 studies, 23 of which were conducted within formal PE contexts in primary and secondary education. Although it considered more studies, it included elements that would distort the objective of our study. Including

studies that consider extracurricular sports activities or those in primary education would not provide insight into the current situation in formal educational contexts and among adolescents, a high-risk age group. Furthermore, the study by Opstoel et al. (2020), contrary to the standardised PRISMA review criteria, did not conduct a quality analysis of the included studies. Social-emotional education is essential for the comprehensive education of future citizens and a duty for educational institutions, so it is necessary for studies to focus on this formal context. Future studies should intensify research on the application of SEL programmes in formal educational settings to provide consistent evidence that enhances quality experiences and promotes implementation in compulsory education.

The quality of studies, teacher training and model fidelity

Despite the unanimous positive results of this review, these should be interpreted cautiously due to the limited number of studies, methodological diversity, and low quality level. This is the first study to conduct a quality analysis of the studies, showing that none met more than 70% of the criteria analysed. Additionally, this review shows that only 11 studies over the past 10 years have examined the benefits of educational interventions on social and emotional aspects in adolescent PE. This issue was already noted in the prior review by Opstoel et al. (2020), covering 2008 to 2017; however, the number of studies has not significantly increased in the following decade. Given the information on the high prevalence of mental health issues among those aged 15 to 19 (13.96%) (Kieling et al., 2024), there is a reinforced need to intensify research efforts into the role PE can play in addressing this issue.

Another indication of the low attention that SEL receives in the field of PE is that none of the papers included in the study appear in journals of recognised international prestige in the field of PE. This suggests a clear publication bias in this area and, consequently, a distortion of the information on socio-emotional education in the scientific literature specialising in PE. Most of the studies have been published in multidisciplinary journals, which indicates a lack of awareness of this topic in the publishers of the PE journals with the greatest international impact. Although health is a central theme in the scientific literature in the field of physical activity and sport (Simbolon, 2024), mental health and socio-emotional development interventions have little presence in this field.

The diversity of the studies was already pointed out by Opstoel et al. (2020) as one of the main problems in SEL studies. The analysis reveals a large disparity in study design, only four were quasi-experimental and one was a mixed design. The studies that were randomised, none applied randomisation in the individualised allocation of students to study groups. The groups were configured in a natural way, so that the clusters that exist in the schools were maintained and randomisation was applied to the allocation of experimentality to the different groups. These are the usual randomisation processes in studies in educational settings. In addition, the study samples were non-representative and heterogeneous, with sample sizes ranging from 34 to 1332 participants, making it difficult to compare results.

The bias of the country of development of most of the studies, Spain, was also perceived as a problem, however, this also shows a sensitivity of this country to this issue. In this respect, the studies analysed in the work of Opstoel, et al. (2020) were located especially in North America, although Spain was also one of the countries with the highest concentration of studies. These differences were due to the different target populations in both studies, adolescents and in formal school settings.

Other problems identified regarding the quality of the studies were the use of non-validated instruments, the absence of statistical power calculation and blinded evaluation of the results, and the absence of effect size calculation. These aspects need to be improved in future research to generate comparable results and to develop meta-analytical studies that quantify the scientific evidence.

Finally, in relation to the quality criteria of the studies, the results related to how the interventions are implemented suggest that the fidelity process, as well as teacher training, should be considered as key and essential criteria for the improvement of the quality of these studies. Both concepts are the best guarantee of the adequate implementation of a specific educational model and in our case of SEL. It is worrying that only three studies describe the use of fidelity assessment tools, and only two clarify the observational methodologies used for fidelity assessment, teacher training and implementation monitoring. It is imperative that future studies incorporate more rigorous assessment of fidelisation through valid and reliable blinded evaluation of interventions (Bessa et al., 2019; Opstoel et al., 2020), provide more detail on teacher training, and monitor and evaluate implementation.

Measuring instruments in social and emotional learning in PE

The results on measurement instruments reflect a lack of consensus on the use of tools to assess variables related to social and emotional competences. The Trait Meta-Mood Scale, one of the most widely used instruments in research on emotional intelligence (Bru-Luna et al. 2021), was used in two of the studies (González et al., 2019; Constantino-Murillo & Espada Mateos, 2021). Based on Mayer and Salovey's model of emotional intelligence (Fernández-Berrocal & Aranda, 2008), this instrument assesses three dimensions of emotional intelligence: attention to feelings, emotional clarity and emotion repair (Fernández-Berrocal et al., 2004). From our perspective, this is the one that best fits the emotional factors of the CASEL programme, self-awareness, self-management and social awareness. In a similar situation is the instrument of Cecchini et al. (2018) used in one of the studies (Rivera-Pérez et al., 2020). Other complementary measures of emotional competences were also found in the other instruments analysed, but with more specific applications (Supplementary Material IV).

Studies analysing social competences are in a similar situation. Social and personal responsibility questionnaires (Manzano-Sanchez et al., 2021), cooperative learning questionnaires (Rivera-Pérez et al., 2020), as well as social skills inventories (Manzano-Sanchez et al., 2021) are the most related to efficient interventions for SEL development. On the other hand, the social skills inventory developed by Leme et al. (2016), assesses adolescents and their social interactions to extract prosocial and antisocial behaviours.

The variety in the assessment of social and emotional competences in PE reflects the dispersion of research that has been questioned in the implementation of SEL programmes. According to Dyson et al. (2020), studies in this field were not originally conceived as studies of SEL programmes, which limits the available evidence. Nevertheless, as in our work, other studies have found connections between the personal and social responsibility model, cooperative learning and outdoor activities with SEL (Dyson et al., 2020; Opstoel et al., 2020). Furthermore, taking into account the works analysed in our study, it is considered necessary to delve into the potential of expressive physical activities within the framework of a yet to be defined teaching model of PE through expressivity, or from the perspective of the use of multi-models for creative development (León et al., 2024) in the development of SEL programmes. In this context, Hughes (2020) suggests that the combination of models, such as personal and social responsibility and sports education, could be an effective alternative, incorporating the cooperative model as a novelty with significant implications in the development of SEL.

Pedagogical models in social and emotional education within PE

Results on pedagogical models indicated that the most commonly used were the sport education model, the personal and social responsibility model, and the cooperative learning model. All of these models, already described as common in previous studies (Dyson et al., 2020; Opstoel et al., 2020), share some of CASEL's five core competencies: promoting interaction and cooperative work, using dialogue and reflection as a consensus tool, generating shared responsibilities, consensual conflict resolution, and attention and respect for one's own and others' emotions. These characteristics demonstrate that prosocial interventions in PE, regardless of the educational model used, are compatible with SEL.

The analysed studies have presented the development of social and emotional competencies through different types of content. The previous review by Opstoel et al. (2020) categorised interventions by thematic categories of SE competencies, such as coping skills, management and resilience, goal-setting, decision-making, problem-solving, responsibility, leadership, cooperation, meeting new people and friends, communication, prosocial behaviour, and transfer to other contexts. However, the studies analysed in this review, while they examine these characteristics as outcomes, were organised based on the educational models used and the type of content or activity applied for SEL development.

Regarding the activities used in relation to theoretical frameworks, not all studies considered the need to ensure consistency in the proposed work, as is the case with studies that included body expression activities, yoga, or mindfulness but did not include a theoretical framework in the interventions. From our perspective, while the lack of consistency in theoretical frameworks in these studies is a limiting factor, the application of SEL in such approaches could have significant, yet-to-be-developed potential that could be demonstrated in future studies.

The most common content in the studies was sports-related, following established educational models (Fernández-Rio & Iglesias, 2024; Muñoz-Arroyave, et al., 2020), which provide clear criteria for implementation and evaluation, strengthening interventions and facilitating their replication. The sport education model enhances social interactions and develops multiple roles among students (Garcia-López et al., 2012; García-López & Gutiérrez-Díaz, 2013). The personal and social responsibility model promotes values through physical activity and sports, as well as positive relationships and self-development (Escartí et al., 2010). Cooperative learning fosters interdependence and positive relationships, positioning the teacher as a co-learner (Fernández-Río, 2014). Problem-solving activities allow for improved peer socialisation (Corrales-Perea & Espada, 2022).

Although these models are not the same as the ones included in other review studies and do not explicitly mention SEL programmes (Dyson et al., 2020; Opstoel et al., 2020), they coincide in developing similar characteristics, such as students' physical, social, emotional and cognitive development, promotion and nurturing of social interaction, teamwork, responsibility and role sharing, respect, empathy in coping and problem solving (Constantino-Murillo & Espada-Mateos, 2021; Rosado et al., 2022). All of these fit into the 5 core competences on which the CASEL programme is based. However, there is great difficulty in determining whether any of the models reviewed can achieve SEL results on their own (Dyson et al. 2020). At this point, it is suggested that future research on the models converge both within PE and in other subjects to address the problem more effectively and homogeneously, advancing knowledge and implementation of SEL strategies.

Interventions and their content

The development and implementation of interventions based on different pedagogical models show considerable diversity in their timing, format and content. The most common structure involves an average of 12-16 sessions, with a frequency of two or three one-hour sessions per week, although some studies have used daily sessions. However, the effectiveness of SEL programmes suggests that their implementation in schools should be comprehensive, involving all stakeholders in the educational context (Jones & Bouffard, 2012). The CASEL recommendations emphasise the importance of involving the whole school community at different levels: classroom, school, home and community (Fernández-Martin et al., 2021). Therefore, future research should consider the comprehensive development of interventions in schools by implementing SEL programmes in all subjects taught, which is a major challenge for the development of collaborative and interdisciplinary work.

There is a wide variety of topics. Techniques such as relaxation, yoga, breathing exercises and mindfulness are used, showing an interest in teaching self-awareness and stress and anxiety management (Mesa et al., 2023, Turrado & Río, 2023). Activities related to personal responsibility, respect for others, strategies for coping with social and emotional situations and social and emotional skills are included, reflecting a concern for socio-emotional development and interpersonal relationships in sport contexts. Activities are used for problem solving, emotional regulation and the promotion of pro-social norms, highlighting the importance of promoting coping and coexistence skills. This diversity of approaches highlights the multiple possibilities of PE as a context for implementing SEL programmes (Dyson, 2014), although it also highlights the need to put the pieces back together for a more comprehensive approach that is fully aligned with these programmes.

One of the issues previously described (Opstoel et al., 2020) is the lack of precise information on the content and implementation of interventions. Our review confirms the difficulty in replicating such studies due to the limited information provided about the interventions. The lack of clear and specific objectives for the interventions, the absence of clearly defined teaching strategies and teaching skills, as well as principles for intervention development, were aspects identified in this review. In addition to these issues, a major challenge in implementing SEL programmes lies in establishing them as a standard practice within schools with the commitment of all parties involved. However, the benefits are highly significant, both academically and socially: improvements in performance, social skills and relationships, health, and mental well-being (Ng, 2023). This demonstrates that students from disadvantaged backgrounds with deficits in both mathematical and socio-emotional education faced greater challenges in completing their schooling than those with deficits in mathematics and language (Hakkarainen et al., 20216).

Limitations, future lines of work, and applications

The limitations of this study's results include the small number of works, the language of the search, the exclusion of qualitative studies, and the low quality of most of the analysed articles. Attention to qualitative studies is essential, as their inclusion could enrich findings on social and emotional aspects by allowing a deeper understanding of the motives and perceived benefits for the various agents involved in SEL programmes.

The low quality of the reviewed studies should set the standards that future work must meet. The development of future comparable studies using valid assessment instruments that analyse CASEL's five competencies will help deepen the role of PE in implementing SEL programmes.

Future lines of research on socio-emotional learning in PE involve integrating interventions adapted to SEL programmes and implementing them within global initiatives in educational contexts, adhering to quality criteria and considering factors that have not yet been studied, such as differences by gender, educational level, or content type. Future studies should be developed within the socio-ecological paradigm, with the involvement of all agents surrounding educational institutions (local councils, health centres, libraries...) as well as closer ones (faculty, teaching staff, families, support staff...). Implementing such initiatives requires an effort to create a school-wide culture, leading to medium- or long-term adoption across all subjects and operational aspects. This also implies that more longitudinal studies are needed to assess and adapt to a complex system of implementation. Additionally, to evaluate social and emotional outcomes, both quantitative and qualitative tracking is necessary, not only for research but also to ensure that implementation is suited to the characteristics and needs of each school. Finally, as mentioned in other educational review studies on SEL (Corcoran et al., 2018), it is necessary to increase the number of studies with randomised intervention assignments to achieve quality results.

The contributions of this study in terms of the application of SEL programmes from different pedagogical models is the demonstration of the versatility of the implementation of these programmes in PE. The methodological contributions highlight the minimum quality criteria necessary in quantitative studies: sample selection and attrition, choice of assessment instruments, teacher training, fidelity to the intervention. Pre-test and post-test analyses are also recommended, as well as follow-up through longitudinal studies that tell us what happens and how to proceed in long-term work. Finally, practical contributions show the effectiveness of using SEL in practice-based models with resources such as pre-sport games and competitive activities, and the potential of other activities such as expressive physical activities. Although the studies are limited to an average of 12-16 sessions, we believe that SEL should be a way of working that can be applied to all PE content.

Conclusions

The results of this study indicate that the development of work on socio-emotional education in PE is at an early stage and that high-impact journals in the specific field of PE should increase the visibility of research on socio-emotional education. It is essential to increase the number and quality of future studies to promote new knowledge and to integrate PE into global school projects that promote socio-emotional education.

The existing literature suggests that PE, emotional and social responsibility and cooperative learning models, as well as problem-solving activities, have demonstrated their effectiveness in socio-emotional learning, typically using an average of 12-16 sessions. The variety of pedagogical models, types of interventions, content and activities, assessment tools, the lack of detail in the description and application of interventions, and the lack of full integration of PE interventions into SEL programmes require a concerted effort to improve the quality of studies and thus strengthen research on the impact of PE on students' socio-emotional learning.

Studies on SEL in PE have been developed mainly in Spain, with some work also emerging in North America. This limits the generalisability of the findings, but highlights Spain's leadership in this area.

Teacher training and evaluation of the fidelity of interventions are key quality factors that should be included and described in detail in future studies of socio-emotional education in PE.

Studies on socio-emotional education have been developed across different pedagogical models, all of which have yielded positive results, especially practice-based models such as sport education, personal and social responsibility, and cooperative learning. However, it is necessary for future studies, developed under these or other pedagogical models, to incorporate the five core competencies outlined in the CASEL programme to obtain results that are comparable with those of the most established studies in the field of socio-emotional education research.

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Supplementary Material

The supplementary material can be found at this link https://osf.io/y23rk/

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