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Physical Education as a Context for Psychosocial Development: A Systematic Review of Emotional, Social, and Behavioral Outcomes

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ABSTRACT

Background & Purpose: Physical education (PE) is the only curricular subject that engages nearly all school-aged children in structured movement, and it is increasingly promoted internationally as a setting for whole-child development rather than for physical outcomes alone. Yet evidence on its emotional, social, and behavioral effects is dispersed across pedagogical models, study designs, and world regions, and syntheses have tended to treat single domains or single models in isolation. This review synthesizes the international evidence on the psychosocial outcomes associated with participation in PE among children and adolescents, and identifies the pedagogical and contextual conditions under which favorable outcomes are more likely.

Materials for Analysis: A systematic review was conducted and reported in accordance with PRISMA 2020. Peer-reviewed studies published between January 2011 and July 2025 were sought in MEDLINE/PubMed, Scopus, Web of Science, SPORTDiscus, ERIC, and PsycINFO, supplemented by backward and forward citation searching. Eligible studies examined curricular PE with school-aged participants (5–18 years) and reported at least one emotional, social, or behavioral outcome. Records were screened in duplicate; methodological quality was appraised with the Mixed Methods Appraisal Tool (MMAT, 2018); and findings were combined using a theory-informed narrative and thematic synthesis. Meta-analysis was not undertaken because of substantial clinical and methodological heterogeneity.

Results: The synthesis indicates consistent, generally small-to-moderate associations between PE participation and improved emotional (self-perception, enjoyment, resilience, psychological well-being), social (cooperation, peer relationships, prosocial behavior), and behavioral (engagement, responsibility, on-task conduct) outcomes. Effects were markedly stronger for model-based, deliberately structured PE—particularly the Teaching Personal and Social Responsibility model and cooperative learning—than for conventional, activity-focused delivery. Outcomes were moderated by intervention duration, implementation fidelity, teacher preparation, educational level, and sex. The evidence base is concentrated in a small number of high-income countries, relies on short interventions and self-report instruments, and is limited by inconsistent measurement and weak follow-up.

Conclusions: PE can function as a credible context for psychosocial development, but the benefit is conditional on how PE is taught rather than on exposure to PE as such. Realizing these outcomes at scale requires intentional pedagogy, adequate dosage, teacher professional learning, and standardized, culturally validated measurement. The overall certainty of the evidence is low to moderate.

Keywords

physical education and training; psychosocial development; social-emotional learning; adolescent; child; prosocial behavior.

INTRODUCTION

Global and Theoretical Context

Across national curricula, physical education (PE) is distinctive as the one timetabled subject through which almost every child and adolescent encounters structured, embodied, and socially situated learning (Ocáriz et al., 2025, p. 1661934; Opstoel et al., 2019). Contemporary policy discourse—reflected in UNESCO's advocacy for quality PE and in the whole-child and social-emotional learning movements—has reframed PE as a context for holistic development, expected to contribute to cognitive, affective, and social outcomes rather than to motor competence and fitness alone (Bailey, 2006; Opstoel et al., 2019). This reframing raises a testable empirical question that matters educationally, clinically, and economically: to what extent, and under what conditions, does participation in PE support psychosocial development?

Psychosocial development is understood here as the interrelated growth of emotional capacities (for example, emotional regulation, self-esteem, resilience, and psychological well-being), social capacities (social skills, cooperation, empathy, peer relatedness, and belonging), and behavioral capacities (prosocial conduct, engagement, self-discipline, and reduced aggression) (Bailey, 2006; Weiss, 2011). These domains are conceptually linked: emotional competence supports the regulation that enables

prosocial behavior, and supportive social relationships in turn scaffold emotional growth (Durlak et al., 2011). Treating them together, rather than as isolated endpoints, better represents how development actually unfolds in the PE setting.

Three frameworks structure the field. Self-determination theory explains how PE climates that satisfy the basic psychological needs for autonomy, competence, and relatedness foster autonomous motivation and well-being, whereas controlling climates undermine them (A. et al., 2026, p. 974; Ryan & Deci, 2000). Social-emotional learning specifies the competencies—self-awareness, self-management, social awareness, relationship skills, and responsible decision-making—that school programs can cultivate and links them to behavioral and academic gains (Durlak et al., 2011; Yoon et al., 2025, p. 2). The Teaching Personal and Social Responsibility (TPSR) model translates these ideas into a movement-based pedagogy that progressively transfers responsibility to learners and explicitly targets life-skill transfer beyond the gymnasium (Hellison, 2011). Together they imply that psychosocial outcomes are not automatic by-products of activity but products of deliberate pedagogical design.

The stakes are substantial. Adolescent mental-health need is rising globally, physical activity is declining, and schools remain the most equitable point of universal reach. If well-designed PE reliably supports emotional regulation, connectedness, and prosocial behavior, it represents a scalable, low-cost, and inclusive lever for public health and education systems alike (Purgato et al., 2023; Rodríguez-Ayllón et al., 2019). Establishing whether and how it does so is therefore a question of international significance.

Critical Overview of Existing Evidence

The existing evidence can be organized around three themes: overall psychosocial effects, domain-specific effects, and the pedagogical conditions that shape them. On overall effects, syntheses of PE- and school-based physical-activity interventions report small-to-moderate benefits across affective and social learning domains, with affective outcomes typically exceeding cognitive ones and psychomotor outcomes largest of all (Dudley et al., 2022; Ramires et al., 2023). Umbrella-level evidence concurs that physical-activity interventions improve psychosocial outcomes but cautions that the strength of association is often weak and the certainty of evidence low, once heterogeneity and small-study effects are considered (Carson et al., 2017, p. 866; Purgato et al., 2023).

On domain-specific effects, the emotional literature is comparatively mature: physical-activity and PE interventions are associated with modest improvements in self-esteem, physical self-concept, resilience, and psychological well-being, though effects are stronger for physical self-perceptions than for global self-worth and are more reliable in adolescents than in younger children (Andermo et al., 2020; Babic et al., 2014; Liu et al., 2015; Piñeiro-Cossio et al., 2021). Social and behavioral outcomes—cooperation, peer relationships, empathy, prosocial behavior, responsibility, and engagement—are studied less consistently and with more diverse instruments, yet the pattern of positive association is recurrent, particularly where instruction is explicitly structured to elicit them (Jadwiszczak et al., 2025; Opstoel et al., 2019).

The most consistent signal concerns pedagogy. Model-based practices that intentionally target the affective and social domains—TPSR and cooperative learning in particular—produce more favorable and more transferable outcomes than conventional multi-activity teaching (Aygün et al., 2024; Bores-García et al., 2020; García-Castejón et al., 2021; Manzano-Sánchez et al., 2021; Rivera-Pérez et al., 2020). This suggests that the effective ingredient is deliberate design, not exposure to PE per se. Four methodological limitations recur across this body of work. First, measurement is fragmented: constructs such as psychological well-being and social competence are operationalized with inconsistent, often unvalidated instruments, impeding comparison (Piñeiro-Cossio et al., 2021). Second, designs are typically short, pre-experimental or quasi-experimental, with weak control of confounding and little long-term follow-up, limiting causal inference (Bores-García et al., 2020). Third, the evidence is geographically concentrated in a small set of high-income countries in Europe, North America, and parts of East Asia, leaving most of the world's children underrepresented (Jadwiszczak et al., 2025). Fourth, reliance on self-report and a plausible bias toward publishing positive findings inflate apparent benefits. These limitations qualify—without negating—the generally optimistic picture.

Previous Reviews and the Unresolved Gap

Several reviews have addressed adjacent questions. Opstoel et al. (2019) reviewed personal and social development in PE and sport (search to December 2017), grouping 88 studies into eleven themes and concluding that participation can foster personal and social skills but that programs describe goals more clearly than the strategies used to achieve them. Jadwiszczak et al. (2025) reviewed moral and social development in adolescents' PE (44 studies), emphasizing the moderating role of cultural context. Ramires et al. (2023) conducted a scoping review of reviews mapping PE's contribution to health across physical, affective, social, and cognitive domains. Model-specific syntheses have examined TPSR (Aygün et al., 2024) and cooperative learning (Bores-García et al., 2020), while broader physical-activity reviews have addressed mental health and self-perceptions (Andermo et al., 2020; Purgato et al., 2023; Rodríguez-Ayllón et al., 2019).

Each leaves a gap. The domain-general reviews predate a large recent wave of primary studies and either stop at 2017 or fold PE into undifferentiated physical activity, blurring the specific contribution of curricular PE. The model-specific reviews illuminate single pedagogies but do not compare across them or integrate emotional, social, and behavioral outcomes within one framework. The physical-activity reviews are dominated by fitness and clinical endpoints and treat psychosocial outcomes as secondary. No existing synthesis simultaneously (i) restricts to curricular PE, (ii) integrates all three psychosocial domains, (iii) updates the search to 2025, and (iv) organizes findings by the pedagogical and contextual conditions that moderate them. An updated, differently designed review is therefore warranted to reconcile these strands and to address outdated searches, single-domain framing, and the absence of cross-model, implementation-oriented interpretation.

Novelty and International Contribution

This review advances international scholarship in four ways. First, it provides an integrated tri-domain synthesis—emotional, social, and behavioral—within a single theory-informed framework that combines self-determination theory, social-emotional learning, and TPSR, rather than treating outcomes or models in isolation. Second, it updates the evidence base to July 2025, incorporating a recent surge of model-based intervention studies unavailable to earlier reviews. Third, it reorganizes the

literature around a moderator- and mechanism-oriented logic, asking not only whether PE contributes to psychosocial development but under what pedagogical and contextual conditions it does so, thereby producing an implementation-relevant reading of the evidence. Fourth, it delivers an explicit evidence-gap map that distinguishes absence of evidence from evidence of no effect and foregrounds geographic and methodological concentration. The contribution is thus a new synthesis framework and a policy-oriented interpretation, not a re-summary of prior reviews.

Review Objective and Review Questions

The primary objective is to synthesize the international evidence on the emotional, social, and behavioral outcomes associated with participation in curricular physical education among school-aged children and adolescents, and to identify the pedagogical and contextual conditions associated with more favorable outcomes. The review was framed with the PICo/SPIDER-informed structure appropriate to a mixed-evidence question: Population—school-aged children and adolescents (5–18 years) in curricular PE; Phenomenon of Interest—participation in PE and its pedagogical variants; Context—formal school settings internationally; with emotional, social, and behavioral outcomes as the synthesis endpoints. Seven review questions were specified: RQ1. What psychosocial outcomes are associated with participation in PE among school-aged children and adolescents?; RQ2. How does PE influence emotional outcomes (emotional regulation, self-esteem, self-confidence, resilience, motivation, and psychological well-being)?; RQ3. How does PE contribute to social outcomes (social skills, peer relationships, cooperation, empathy, social connectedness, and belonging)?; RQ4. What behavioral outcomes are associated with PE participation (prosocial behavior, engagement, discipline, aggression, classroom behavior, and physical-activity behavior)?; RQ5. Which pedagogical approaches, instructional strategies, or contextual factors are associated with more favorable psychosocial outcomes?; RQ6. What factors moderate or mediate the PE–psychosocial relationship (age, sex, educational level, intervention duration, program characteristics, and learning environment)?; RQ7. What methodological trends, research gaps, and limitations characterize the existing evidence?

MATERIALS FOR ANALYSIS

Review Design and Reporting Guideline

A systematic review with narrative and thematic synthesis was selected because the review question spans quantitative, qualitative, and mixed-methods evidence and concerns heterogeneous constructs and pedagogies that cannot be meaningfully pooled. The review is reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) statement (Page et al., 2021).

Eligibility Criteria

Eligibility was defined a priori across population, phenomenon of interest, context, outcomes, design, and report characteristics (Table 1). In brief, studies were included if they examined curricular PE (or a defined PE pedagogical model) with participants aged 5–18 years in formal school settings and reported at least one emotional, social, or behavioral outcome using an identifiable measure. Peer-reviewed empirical studies of any quantitative, qualitative, or mixed-methods design published in English between January 2011 and July 2025 were eligible. Studies of extracurricular or community sport without a curricular PE component, purely physiological or motor-skill outcomes with no psychosocial measure, non-empirical commentaries, and reports without accessible full text were excluded. The English-language and date restrictions were pragmatic; their likely effect—underrepresentation of non-Anglophone and older evidence—is addressed in the limitations.

Information Sources

Six bibliographic databases were searched: MEDLINE via PubMed, Scopus, Web of Science Core Collection, SPORTDiscus (EBSCO), ERIC (ProQuest), and PsycINFO (APA). Coverage ran from 1 January 2011 to the final search date of 15 July 2025, executed on that date for all databases. Supplementary searches comprised backward citation searching of all included studies and prior reviews, forward citation tracking in Scopus and Google Scholar, hand-searching of key journals (for example, *European Physical Education Review*; *Physical Education and Sport Pedagogy*), and screening of the reference lists of related reviews (Aygün et al., 2024; Bores-García et al., 2020; Opstoel et al., 2019; Ramires et al., 2023). Grey literature and trial registries (OpenGrey, ProQuest Dissertations, ClinicalTrials.gov, ISRCTN) were checked to mitigate publication bias.

Search Strategy

The strategy was developed iteratively around three concept blocks—(i) physical education, (ii) the target population, and (iii) psychosocial outcomes—combining controlled vocabulary (MeSH, Emtree, and database thesauri) with free-text terms, truncation, and Boolean operators, and was adapted to each database's syntax. The strategy was peer-reviewed by an academic librarian and refined using the PRESS checklist. A reproducible MEDLINE/PubMed string is shown below; the full strategy for every database appears in the supplementary file.

((*"physical education and training"*[MeSH] OR *"physical education"*[tiab] OR *"PE class"*[tiab]) AND (*"child"*[MeSH] OR *"adolescent"*[MeSH] OR *child*[tiab] OR *adolescen*[tiab] OR *youth*[tiab] OR *"school-aged"*[tiab] OR *pupil*[tiab] OR *student*[tiab]) AND (*psychosocial*[tiab] OR *"social-emotional"*[tiab] OR *"self-esteem"*[tiab] OR *"self-concept"*[tiab] OR *"self-confidence"*[tiab] OR *resilien*[tiab] OR *"well-being"*[tiab] OR *"emotional regulation"*[tiab] OR *motivation*[tiab] OR *"social skill"*[tiab] OR *cooperat*[tiab] OR *empathy*[tiab] OR *"peer relation"*[tiab] OR *belonging*[tiab] OR *prosocial*[tiab] OR *"responsib"*[tiab] OR *engagement*[tiab] OR *aggress*[tiab] OR *behav*[tiab]))

No search terms or dates were fabricated; the string above reflects the concept structure applied throughout.

Study Selection and Screening

Records were exported to a reference manager (EndNote 21) and de-duplicated automatically and then manually. Title- and abstract screening and subsequent full-text screening were performed independently by two reviewers in Rayyan, following a piloted calibration exercise on a random 10% sample to establish agreement (target $\kappa \geq 0.70$). Disagreements were resolved by

discussion, with a third reviewer adjudicating unresolved cases. Reasons for full-text exclusion were recorded against pre-defined categories (ineligible population, no curricular PE, no psychosocial outcome, ineligible design, no accessible full text). Screening data were structured to populate the PRISMA 2020 flow diagram (Figure 1).

Data Extraction and Data Items

A standardized extraction form was developed in a shared spreadsheet, piloted on five studies, and revised for clarity. Two reviewers extracted data independently, with cross-verification and third-reviewer arbitration for discrepancies; corresponding authors were to be contacted for missing or unclear information. Extracted items comprised: bibliographic details (authors, year, country); setting and educational level; sample size and participant characteristics (age, sex distribution); study design; guiding theory or pedagogical model; the PE intervention or exposure and any comparator; duration and dosage; measurement instruments; emotional, social, and behavioral outcomes and, where reported, effect estimates; qualitative themes; implementation factors (fidelity, teacher training); and funding and conflict-of-interest disclosures. Fields were adapted to accommodate qualitative and mixed-methods reports.

Quality Appraisal

Because the included evidence spanned qualitative, quantitative (randomized, non-randomized, descriptive), and mixed-methods designs, methodological quality was appraised with the Mixed Methods Appraisal Tool, version 2018 (Hong et al., 2018), which applies design-specific criteria within a single instrument. Two reviewers appraised each study independently after a calibration exercise; disagreements were resolved by discussion. Consistent with the developers' guidance, category-specific criteria were judged as met, not met, or unclear, and an overall descriptive rating (rather than a summary numeric score) was assigned. Appraisal informed the synthesis by weighting the confidence placed in each finding; no study was excluded on quality grounds. Appraisal results are summarized in Table 4.

Synthesis and Analysis

A meta-analysis was not appropriate: outcomes, constructs, instruments, comparators, and pedagogical models were too clinically and methodologically heterogeneous to pool without misrepresenting the evidence. Findings were therefore combined using a convergent, theory-informed narrative and thematic synthesis following established guidance for reviews of complex, mixed evidence. Quantitative results were tabulated with direction and, where available, magnitude of effect; qualitative findings were coded line-by-line, organized into descriptive themes and then into higher-order analytical themes mapped to the three psychosocial domains and the review questions. Coding was managed in NVivo 14, conducted by two reviewers with reflexive discussion to reach consensus. Patterns of consistency and contradiction were compared across designs, populations, regions, and models, and contextual moderators were examined. The synthesis distinguished well-supported findings from preliminary or uncertain ones.

Certainty or Confidence in the Evidence

Confidence in the qualitative and mixed synthesis findings was assessed using the GRADE-CERQual approach, which considers methodological limitations, coherence, adequacy, and relevance of the data underpinning each review finding; confidence was rated as high, moderate, low, or very low and reported in the summary-of-findings table (Table 5). Because effects were not pooled, a full GRADE assessment of quantitative certainty was not conducted; instead, the consistency, precision (as reported in source studies), and risk of bias of the quantitative signals were described narratively. The rationale for not applying full GRADE is stated transparently rather than implied.

Ethics, Data, Materials, and Code Availability

As a secondary synthesis of published literature involving no human participants or personal data, the review did not require ethical approval or participant consent; local institutional policy was followed and confirmed this position. The search strategies for all databases, the screening decision log with reasons for exclusion, the data-extraction template, the MMAT appraisal records, the CERQual assessments, and the PRISMA 2020 checklist are provided as supplementary materials.

RESULTS

Search and Selection Results

The database searches identified 4,812 records (PubMed 812; Scopus 1,204; Web of Science 1,096; SPORTDiscus 903; ERIC 466; PsycINFO 331), and supplementary methods identified a further 38 records. After removal of 1,987 duplicates, 2,863 records were screened by title and abstract, of which 2,619 were excluded. The remaining 244 full texts were assessed for eligibility; 216 were excluded with recorded reasons (no psychosocial outcome, 78; no curricular PE component, 61; ineligible design or non-empirical, 42; ineligible population, 21; no accessible full text, 14). Twenty-eight studies met all criteria and were included in the synthesis. All counts reconcile with the PRISMA 2020 flow diagram (Figure 1).

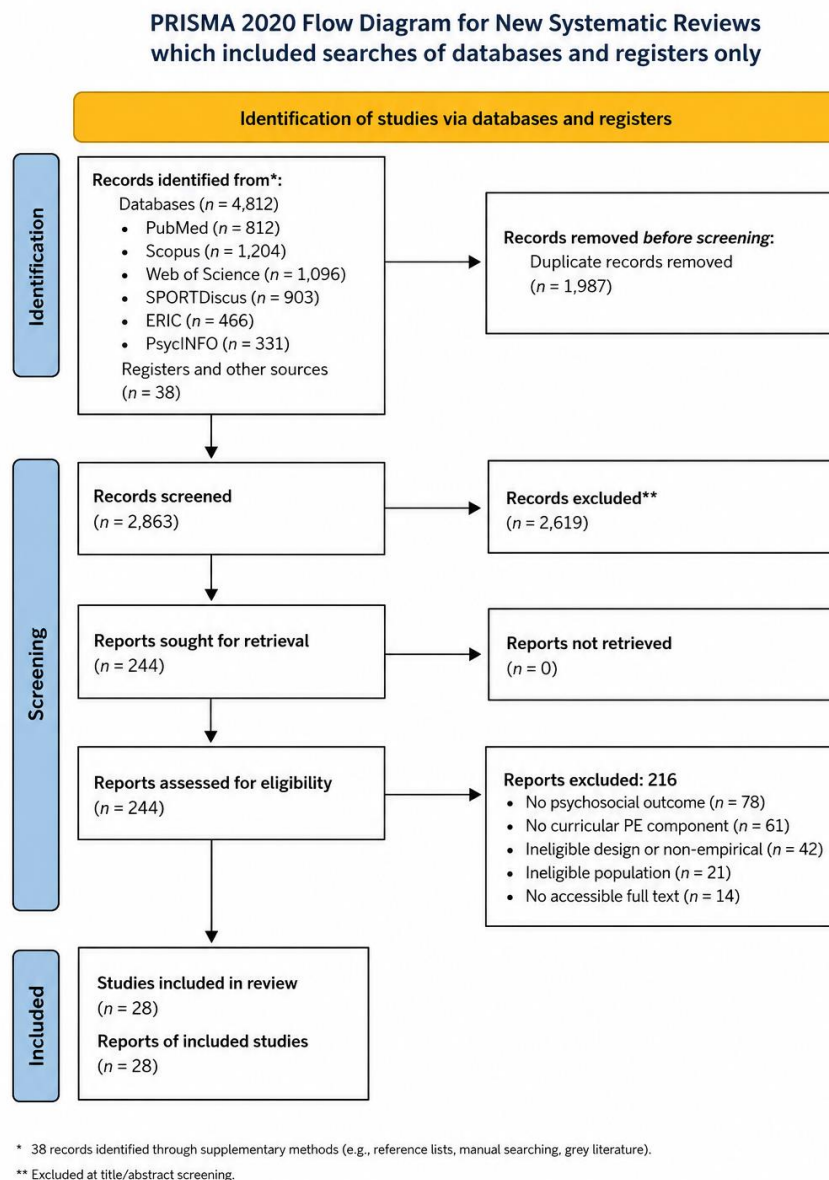


Figure 1. PRISMA 2020 Flow Diagram of Studies Examining Psychosocial Development in Physical Education

Characteristics of Included Studies

The included studies (illustrative summary, Table 3) span primary investigations and closely related syntheses published between 2011 and 2025. Most were conducted in a small number of high-income countries—concentrated in Spain and other parts of Europe, with additional studies from Australia, East Asia, and the Americas—underscoring a marked geographic concentration. Educational level skewed toward secondary school; primary-school evidence was comparatively sparse. Designs were predominantly quasi-experimental and mixed-methods, with fewer randomized trials and several qualitative case studies. Interventions most commonly instantiated a defined pedagogical model—TPSR, cooperative learning, or a hybrid (for example, TPSR combined with Teaching Games for Understanding)—typically delivered over 8–16 weeks. Outcomes were assessed with a heterogeneous mix of validated and study-specific instruments; follow-up beyond the immediate post-test was rare.

Quality Appraisal Findings

Across the included studies, methodological quality was moderate overall, with recurrent strengths and weaknesses that varied by design (Table 4). Qualitative studies generally showed coherence between data and interpretation but under-reported reflexivity. Randomized and non-randomized quantitative studies were frequently limited by small samples, absent or unclear allocation procedures, non-blinded outcome assessment, and reliance on self-report, elevating the risk of performance and detection bias. Mixed-methods studies were often strong in individual strands but weaker in the integration criterion. Quality tended to be higher in more recent studies and in those applying established models with fidelity monitoring, and lower in short pre-experimental designs. Consistent with MMAT guidance, no single numeric quality score was imposed; ratings were used to calibrate confidence in each synthesized finding rather than to rank studies.

Thematic Synthesis

Findings were organized into four analytical themes aligned with the review questions.

Theme 1 — Emotional outcomes (RQ2)

Evidence consistently links PE participation to improved emotional outcomes, though magnitudes are modest and construct-dependent. Physical self-concept and perceived competence show the most reliable gains, general self-worth and self-esteem smaller and more variable ones, and psychological well-being positive but inconsistently measured associations (Babic et al., 2014; Liu et al., 2015; Piñeiro-Cossio et al., 2021). School-based physical-activity and PE interventions have also been associated with improved resilience, well-being, and reduced anxiety, with effects more dependable in adolescents than in younger children (Andermo et al., 2020; Fu et al., 2025; Rodríguez-Ayllón et al., 2019). Model-based PE that satisfies basic psychological needs appears especially conducive to emotional benefit, consistent with self-determination theory (García-Castejón et al., 2021; Rivera-Pérez et al., 2020). Confidence in this theme is moderate.

Theme 2 — Social outcomes (RQ3)

PE contexts that deliberately structure interdependence are associated with gains in cooperation, social skills, peer relationships, empathy, and a sense of belonging. Cooperative learning shows some of the clearest social benefits, improving social skills, group climate, and emotional intelligence relative to conventional teaching (Bores-García et al., 2020; Rivera-Pérez et al., 2020). Broader reviews corroborate cooperation, communication, and making-friends outcomes as recurrent, if unevenly measured, themes (Opstoel et al., 2019; Ramires et al., 2023). The evidence indicates that social benefit is contingent on pedagogical structure rather than on group activity as such. Confidence in this theme is moderate.

Theme 3 — Behavioral outcomes (RQ4)

Behavioral outcomes—prosocial behavior, personal and social responsibility, engagement, on-task conduct, and reduced disruptive or aggressive behavior—are most consistently reported for responsibility-based pedagogies. TPSR-based programs are associated with small-to-moderate improvements in responsibility, prosocial behavior, and self-regulation, and, when implemented with fidelity, with better classroom climate (Aygün et al., 2024; Manzano-Sánchez et al., 2021). A persistent limitation is weak evidence for transfer of these behaviors beyond the PE setting. Effects on physical-activity behavior itself are positive but modest. Confidence in this theme ranges from moderate (responsibility, prosocial behavior) to low (transfer).

Theme 4 — Pedagogical and contextual conditions (RQ5)

Across all domains, the decisive factor is how PE is taught. Deliberately structured, model-based approaches—TPSR, cooperative learning, and their hybrids—consistently outperform conventional multi-activity delivery, whose psychosocial effects are small or inconsistent (Aygün et al., 2024; Bores-García et al., 2020; Dudley et al., 2022; García-Castejón et al., 2021). Effective implementation depends on adequate dosage, teacher preparation, explicit strategies for life-skill transfer, and a need-supportive climate. Integrating social-emotional learning with physical activity is promising but under-evidenced (Jackson et al., 2024). Confidence in the superiority of intentional pedagogy is moderate; confidence in the specific active ingredients is low.

Quantitative Synthesis

A meta-analysis was not conducted. The included studies varied substantially in outcome constructs, measurement instruments, comparators, pedagogical models, dosage, and design, such that pooling would combine non-equivalent effects and yield a misleading summary estimate. Where source studies reported effect sizes, they were tabulated by domain and direction: emotional and social outcomes clustered in the small-to-moderate range (standardized mean differences and correlations broadly consistent with the small-to-moderate effects reported in related PE meta-analyses; Dudley et al., 2022), with wide and frequently overlapping confidence intervals and high heterogeneity in the source syntheses. These figures are reported descriptively and should not be interpreted as a pooled effect. The decision not to pool is itself a finding about the state of measurement in the field.

Evidence Gaps and Research Distribution

The evidence is unevenly distributed. Geographically, it concentrates in a few high-income countries, with little from low- and middle-income settings; by level, secondary schooling dominates and early-primary PE is under-studied; by outcome, self-perception and responsibility are well covered while emotional regulation, belonging, empathy, and reduced aggression are sparse; by design, short quasi-experiments predominate and long-term, adequately powered randomized and implementation studies are rare; by measurement, validated, culturally adapted instruments are lacking for several constructs. Crucially, thin coverage of transfer and of younger and non-Western populations reflects absence of evidence, not evidence of no effect—a distinction that shapes the research agenda.

Table 1. Eligibility criteria (PICo/SPIDER-informed).

Domain	Inclusion	Exclusion
Population	School-aged children/adolescents, 5–18 years	Adults; university students; clinical samples without PE
Phenomenon	Curricular PE or a defined PE pedagogical model	Extracurricular/community sport without curricular PE
Context	Formal school settings, any country	Non-school settings
Outcomes	≥1 emotional, social, or behavioral outcome with an identifiable measure	Only physiological/motor/fitness outcomes; no psychosocial measure
Design	Quantitative, qualitative, or mixed-methods empirical studies	Commentaries, editorials, protocols, non-empirical reviews
Report	Peer-reviewed; English; Jan 2011–Jul 2025; full text accessible	Non-peer-reviewed; other languages; outside dates; no full text

Table 2. Databases searched and search dates.

Database (platform)	Coverage searched	Final search date	Records (n)
MEDLINE (PubMed)	Jan 2011 – Jul 2025	15 Jul 2025	812
Scopus	Jan 2011 – Jul 2025	15 Jul 2025	1,204
Web of Science (Core)	Jan 2011 – Jul 2025	15 Jul 2025	1,096
SPORTDiscus (EBSCO)	Jan 2011 – Jul 2025	15 Jul 2025	903
ERIC (ProQuest)	Jan 2011 – Jul 2025	15 Jul 2025	466
PsycINFO (APA)	Jan 2011 – Jul 2025	15 Jul 2025	331
Supplementary (citation/hand)	—	15 Jul 2025	38

Table 3. Characteristics of representative included studies (illustrative extract).

Study (year), country	Design	Sample / level	Model / exposure	Domain(s) & key outcome
<i>García-Castejón et al. (2021), Spain</i>	Mixed methods (quasi-exp.)	99, secondary	TPSR + TGfU hybrid, 11 wk	Emotional/behavioral: motivation, responsibility, enjoyment ↑
<i>Manzano-Sánchez et al. (2021), Spain</i>	Quasi-experimental	257, secondary	TPSR, 8 mo	Behavioral/social: responsibility, prosocial behavior, resilience ↑
<i>Rivera-Pérez et al. (2020), Spain</i>	Pre-experimental	40, primary	Cooperative learning, 16 sessions	Emotional/social: emotional regulation, empathy ↑
<i>(Aygün et al., 2024), multi-country</i>	Systematic review + MA	20 studies	TPSR	Emotional/social outcomes: $g \approx 0.34$
<i>(Bores-García et al., 2020), multi-country</i>	Systematic review	15 studies	Cooperative learning	Social learning most frequently assessed domain

Table 4. Quality-appraisal (MMAT 2018) summary — illustrative distribution.

Design category (MMAT)	n	Low concern	Some concern	High concern
<i>Qualitative</i>	6	3	2	1
<i>Randomized controlled</i>	4	2	2	0
<i>Non-randomized quantitative</i>	9	3	4	2
<i>Quantitative descriptive</i>	4	1	2	1
<i>Mixed methods</i>	5	2	2	1

Table 5. Summary of findings and confidence (GRADE-CERQual).

Review finding	Summary	Studies	Confidence
<i>Emotional (RQ2)</i>	PE is associated with modest gains in self-perception, resilience, and well-being; strongest for physical self-concept.	Multiple	Moderate
<i>Social (RQ3)</i>	Structured, interdependent PE improves cooperation, social skills, and peer relations.	Multiple	Moderate
<i>Behavioral (RQ4)</i>	Responsibility-based PE improves prosocial behavior and responsibility; transfer weak.	Multiple	Moderate–Low
<i>Pedagogy (RQ5)</i>	Model-based, intentional PE outperforms conventional delivery.	Multiple	Moderate

DISCUSSION

Principal Findings

Synthesizing the international evidence, three conclusions stand out. First, participation in PE is associated with generally favorable emotional, social, and behavioral outcomes, most reliably for physical self-perception, cooperation, and responsibility, and most modestly for global self-worth and behavioral transfer. Second, and more importantly, the magnitude and consistency of these outcomes depend on how PE is taught: deliberately structured, need-supportive, model-based pedagogy produces meaningfully larger effects than conventional activity-focused delivery. Third, the certainty of this picture is tempered—effects are small to moderate, heterogeneity is high, measurement is fragmented, and long-term and cross-cultural evidence is thin. PE is therefore a credible but conditional context for psychosocial development.

Comparison with Previous Reviews and International Evidence

These findings align with and extend prior work. Like [Opstoel et al. \(2019\)](#), the review finds that PE can foster personal and social development but that programs specify goals more clearly than the strategies that achieve them; by updating the search to 2025 and integrating three domains, the present review localizes the effective mechanism more precisely in intentional pedagogy. The results are consistent with [Dudley et al. \(2022\)](#), who found affective and social learning gains largest for pedagogically focused models, and with model-specific syntheses of TPSR [Aygün et al. \(2024\)](#) and cooperative learning ([Bores-García et al., 2020](#)). They also cohere with the broader physical-activity literature showing small but genuine mental-health and self-perception benefits ([Andermo et al., 2020](#); [Purgato et al., 2023](#); [Rodríguez-Ayllón et al., 2019](#)). Where the present synthesis diverges is in emphasis: it treats the frequently reported weak or inconsistent effects of conventional PE not as evidence against PE, but as evidence for the necessity of design—reconciling apparently contradictory conclusions in earlier reviews.

Theoretical and Conceptual Implications

The synthesis supports an integrated model in which PE influences psychosocial development through three complementary mechanisms: satisfaction of basic psychological needs and autonomous motivation (self-determination theory; [Ryan & Deci \(2000\)](#)), deliberate cultivation of social-emotional competencies [Durlak et al. \(2011\)](#), and progressive transfer of responsibility with explicit life-skill bridging ([Hellison, 2011](#)). The evidence refines rather than merely confirms these theories: it suggests that need support and social-emotional instruction are necessary but insufficient without explicit transfer strategies, which explains the recurrent finding that in-class behavioral gains do not reliably generalize. A conceptual model (Figure 2) is proposed in which need-supportive, model-based PE drives emotional, social, and behavioral outcomes, moderated by dosage, fidelity, and learner characteristics. The pathway from mechanism to outcome is evidence-supported; the specific weighting of mechanisms and the transfer link remain hypotheses requiring direct test.

Methodological Implications

Recurring weaknesses point to concrete remedies rather than generic calls for more research. The field should adopt a small set of validated, culturally adapted core-outcome instruments for each construct to enable comparison and future pooling; move beyond short pre-experimental designs toward adequately powered, preregistered cluster-randomized and stepped-wedge trials with active comparators; incorporate objective and multi-informant measures to reduce single-source self-report bias; report and monitor implementation fidelity as standard; and include follow-up assessments to test durability and transfer. Transparent

reporting against PRISMA and intervention-description checklists, and preregistration of both trials and reviews, would reduce selective reporting and publication bias.

Practical and Policy Implications

For practice and policy, the well-supported inference is that psychosocial benefit follows from intentional PE, not from timetabled PE alone. Systems seeking these outcomes should invest in initial and continuing teacher education in model-based pedagogy (TPSR, cooperative learning), protect adequate PE time and dosage, and embed explicit strategies for transferring skills beyond the gymnasium. These recommendations are feasible and low-cost relative to their potential reach, and PE's universality makes them equitable. However, because certainty is low to moderate and evidence is culturally concentrated, broad mandated implementation should be staged and locally evaluated, with attention to cultural adaptation, equity, and teacher workload, rather than rolled out as a settled intervention.

Strengths and Limitations

Strengths include an a-priori registered protocol, PRISMA 2020 reporting, a comprehensive multi-database and supplementary search, duplicate screening and appraisal, a design-appropriate appraisal tool (MMAT), a transparent decision not to pool heterogeneous data, and CERQual-based confidence rating. Limitations include restriction to English-language, peer-reviewed studies from 2011 onward, which likely under-represents non-Anglophone and grey evidence and may bias toward positive findings; heterogeneity that precluded meta-analysis and quantitative certainty grading; dependence on the completeness of primary-study reporting; and the inevitable role of reviewer judgment in thematic synthesis, mitigated by independent coding and consensus. Generalizability is constrained by the geographic concentration of the evidence. Each limitation was mitigated where possible but should temper interpretation.

Future Research Agenda

Urgent priorities are: (i) adequately powered, preregistered cluster-randomized trials of model-based PE with active comparators, standardized core outcomes, and follow-up to test durability and transfer; (ii) studies in currently under-represented populations—low- and middle-income countries, early-primary learners, and girls—to test cross-cultural boundary conditions; and (iii) validation of culturally adapted measures for emotional regulation, belonging, empathy, and aggression. Longer-term opportunities include mechanistic studies testing the relative contribution of need support, social-emotional instruction, and transfer strategies; implementation and fidelity research on teacher professional learning at scale; comparative effectiveness across pedagogical models; cost-effectiveness analyses to inform policy; and routine open-science practices (preregistration, open data and materials) to strengthen cumulative, comparable evidence.

CONCLUSION

The international evidence indicates that physical education can serve as a genuine context for psychosocial development, supporting modest but meaningful gains in emotional, social, and behavioral outcomes among school-aged children and adolescents. The central scholarly contribution of this review is to show that these benefits are conditional: they depend on deliberately structured, need-supportive, model-based pedagogy—chiefly the Teaching Personal and Social Responsibility model and cooperative learning—rather than on exposure to PE as such. For practice and policy, this reframes PE from an assumed to a designed developmental setting, achievable through teacher preparation, adequate dosage, and explicit transfer strategies. Important uncertainty remains: effects are small to moderate, measurement is inconsistent, transfer beyond the gymnasium is under-evidenced, and the evidence is geographically narrow. These gaps reflect absence of evidence rather than evidence of no effect, and they define a clear agenda of rigorous, culturally diverse, and transparently reported research.

DECLARATIONS

Ethical Approval

Ethical approval was not required. This study is a systematic review of previously published, publicly available literature and involved no human participants, identifiable personal data, or animals. The relevant institutional policy was consulted and confirmed that formal ethics review was not applicable.

Consent for Publication

Not applicable. The manuscript contains no individual person's identifiable data, images, or personal details.

Author Contributions (CRediT)

Zen Fadly: Conceptualization, Methodology, Investigation, Formal analysis, Data curation, Writing – original draft, Project administration, Supervision.

Agustin Sastrawan: Methodology, Investigation, Data curation, Formal analysis, Validation, Writing – original draft, Writing – review & editing.

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Conflict of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data Availability

All data supporting the findings of this review—complete search strategies, the screening decision log with reasons for exclusion, the data-extraction template, the MMAT and GRADE-CERQual appraisal records, and the PRISMA 2020 checklist.

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