



Cooperative learning and social behavior in physical education: A systematic review

Pembelajaran kooperatif dan perilaku sosial dalam pendidikan jasmani: Tinjauan sistematis

Muhammad Aliffajaruddin Alfani^{1,*} 

¹ Universitas Negeri Malang, Indonesia

email: aliffajar1403@gmail.com

ARTICLE INFO

Received 30 July 2026

Revised 16 September 2026

Accepted 27 September 2026

Published 30 September 2026

Keywords:

Cooperative learning
Gender
Physical education
Social behavior
Systematic review

Kata kunci:

Cooperative learning
Pendidikan jasmani
Perilaku sosial
Systematic review

APA style in citing this article:

Alfani, M., A. (2026). Cooperative learning and social behavior in physical education: A systematic review . *Physical Education Learning, Teaching, and Assessment (PELTA)*, 1(1), 45-51. <https://doi.org/10.68536/pelta.v1i1.18>

ABSTRACT

Background: Cooperative Learning (CL) may support students' social development by promoting interaction, responsibility, and cooperation in physical education.

Objective: This systematic review aimed to synthesize empirical evidence on social and social-emotional outcomes associated with CL implementation, variations in CL approaches, implementation characteristics across educational levels, and evidence regarding gender-related differences.

Methods: The review was conducted in accordance with the PRISMA 2020 guidelines. Searches of Scopus and ERIC identified 31 articles published between 2020 and 2025. Following duplicate removal, title and abstract screening, and full-text assessment, six studies met the eligibility criteria. Methodological quality was appraised using the Mixed Methods Appraisal Tool (MMAT) 2018, and findings were synthesized narratively.

Results: The included studies indicated that CL may support cooperation, interpersonal skills, peer communication and interaction, responsibility, positive interdependence, group processing, promotive interaction, individual accountability, empathy, and emotional regulation. However, evidence regarding gender-related differences was limited and inconsistent. All eligible studies were conducted in primary or secondary education settings, providing insufficient evidence to determine whether CL is more effective at a particular educational level.

Conclusion: Overall, CL shows potential for supporting students' social and social-emotional development in physical education. Further research using stronger study designs, more representative samples, clearer intervention fidelity reporting, and standardized social outcome measures is needed to strengthen the evidence base.

ABSTRAK

Latar belakang: *Cooperative learning (CL)* berpotensi mendukung perkembangan sosial siswa melalui interaksi, tanggung jawab, dan kerja sama dalam pembelajaran pendidikan jasmani.

Tujuan: Penelitian ini bertujuan mensintesis bukti empiris mengenai outcome sosial dan sosial-emosional yang berkaitan dengan implementasi CL, variasi pendekatan CL, karakteristik implementasi pada berbagai jenjang pendidikan, serta bukti mengenai perbedaan respons berdasarkan gender.

Metode: Tinjauan sistematis dilakukan berdasarkan pedoman PRISMA 2020. Pencarian pada Scopus dan ERIC mengidentifikasi 31 artikel yang diterbitkan antara 2020 dan 2025. Setelah penghapusan duplikat, *screening*, dan penilaian *full text*, enam studi memenuhi kriteria inklusi. Kualitas metodologis dinilai menggunakan *Mixed Methods Appraisal Tool (MMAT)* 2018 dan temuan disintesis secara naratif.

Hasil: Hasil menunjukkan bahwa CL berpotensi mendukung kerja sama, keterampilan interpersonal, komunikasi dan interaksi antarteman sebaya, tanggung jawab, *positive interdependence*, *group processing*, *promotive interaction*, *individual accountability*, empati, dan regulasi emosi. Namun, bukti mengenai perbedaan respons berdasarkan gender masih terbatas dan belum konsisten. Seluruh studi yang memenuhi kriteria berasal dari jenjang pendidikan dasar dan menengah, sehingga belum tersedia bukti yang memadai untuk menentukan jenjang pendidikan yang paling efektif.

Kesimpulan: Secara keseluruhan, CL menunjukkan potensi dalam mendukung perkembangan sosial dan sosial-emosional siswa dalam pendidikan jasmani, tetapi diperlukan penelitian dengan desain yang lebih kuat, sampel yang lebih representatif, dan pengukuran *outcome* sosial yang lebih terstandar.

Highlights

- ✓ Cooperative Learning supports multiple social and social-emotional outcomes in physical education.
- ✓ The most consistently reported benefits involve cooperation, interpersonal skills, peer interaction, and responsibility.
- ✓ Evidence remains insufficient to determine consistent gender differences or the most effective educational level for Cooperative Learning.

Introduction

Physical Education, Sports, and Health (PJOK) teachers play a strategic role in fostering students' character development. However, students often perceive physical education teachers primarily as instructors of physical activity (Korur & Sözen, 2019). This perception may reflect the limited use of sport and physical activity as systematically planned and sustained contexts for character development. Effective instructional planning involves not only mastery of subject content but also the ability to design meaningful learning experiences for students (Wu & Liu, 2022). A further challenge arises when physical education places excessive emphasis on the acquisition of technical skills (He et al., 2023). Consequently, the potential of physical education as a context for character development may not be fully realized in schools. When appropriately designed and implemented, however, physical education can provide meaningful opportunities to foster tolerance, sportsmanship, cooperation, and other social skills.

To strengthen the role of physical education in supporting students' social development, instructional strategies are needed that explicitly integrate interaction, responsibility, and cooperation into learning activities. One widely used approach is Cooperative Learning (CL), which has been associated with positive interactions, mutual respect, cooperation, and social development among students (Ali, 2022; Darmawan et al., 2022; Darussalam, et al., 2025; Fauzi et al., 2022; Sa'diyah et al., 2023). Through learning structures that emphasize positive interdependence, peer interaction, individual and group accountability, and interpersonal skills, CL provides opportunities for students to develop both motor competence and social skills within physical education settings (Grinschgl et al., 2025).

Nevertheless, empirical evidence on CL and social behavior in physical education remains dispersed across different research designs, CL approaches, educational levels, and social outcomes. It remains unclear which dimensions of social or social-emotional behavior are most consistently reported following CL implementation and whether patterns of findings vary according to the type or model of CL employed. In addition, the characteristics of CL implementation across different educational levels have not been systematically synthesized, leaving the distribution and variation of its application across age groups insufficiently understood. Evidence regarding possible gender-related differences in responses to CL also remains limited and inconsistent (Cochon Drouet et al., 2024; Molina et al., 2013). These gaps highlight the need for a synthesis that goes beyond summarizing the general benefits of CL by mapping the social outcomes reported, variations in CL approaches, implementation characteristics across educational levels, and the strength of evidence regarding gender-related differences.

Accordingly, this systematic review aimed to identify and synthesize empirical evidence on the implementation of Cooperative Learning and social outcomes in physical education. Specifically, the review sought to identify the social and social-emotional dimensions reported in CL studies, examine patterns of findings across different CL approaches or models, describe the characteristics of CL implementation at different educational levels, and evaluate the extent to which the available evidence supports gender-related differences in responses to CL. Eligible studies were

empirical investigations published in peer-reviewed journals between 2020 and 2025 and identified through Scopus and ERIC.

Materials and Methods

Study Design

This study was conducted as a systematic review and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines (Page et al., 2021).

Search Strategy

A literature search was conducted in two electronic databases, Scopus and ERIC. The search strategy used combinations of terms related to "cooperative learning," "physical education," and "social behavior." The final search was conducted on August 15, 2025, and was restricted to articles published between 2020 and 2025. Open-access status was not used as an eligibility criterion because it does not reflect the methodological characteristics or quality of a study.

Eligibility Criteria

Studies were considered eligible for inclusion if they met the following criteria: (i) they were original empirical research articles published in peer-reviewed journals between 2020 and 2025; (ii) participants were drawn from formal educational settings, including primary, secondary, and higher education; (iii) the study involved the implementation of Cooperative Learning in physical education, including STAD, Jigsaw, Team Games Tournament, Group Investigation, other Cooperative Learning structures or adaptations, or pedagogical approaches that deliberately incorporated and evaluated core elements of Cooperative Learning; (iv) the study directly assessed or reported at least one social or social-emotional outcome, such as social skills, cooperation, interpersonal communication, peer interaction, responsibility, empathy, positive interdependence, group processing, promotive interaction, or individual accountability; and (v) the study employed a design involving the implementation or intervention of Cooperative Learning, including qualitative implementation studies, action research, pre-experimental studies, quasi-experimental studies, or experimental studies.

Studies were excluded if they: (i) were duplicate records; (ii) were not conducted within a physical education context; (iii) assessed only motor skills, physical fitness, physical activity, physical performance, motivation, or academic outcomes without directly measuring social or social-emotional outcomes; (iv) used a cross-sectional or observational design without direct implementation of Cooperative Learning; (v) involved mixed populations or contexts from which physical education-specific data could not be extracted separately; (vi) were editorials, commentaries, opinion papers, conference abstracts without empirical data, book chapters, or literature reviews; or (vii) were conducted outside formal educational settings, such as sports clubs or community-based sport programs.

Study Selection

All records identified through the database searches were imported into Rayyan for reference management and screening. Duplicate records were identified and removed before screening. Two reviewers, Yulingga Nanda Hanief and Rajip Mustafillah Rusdiyanto, independently screened titles and abstracts and subsequently assessed the full texts against the predefined inclusion and exclusion criteria. Disagreements between the two reviewers were resolved through discussion; when consensus could not be reached, a third reviewer, M. E. Winarno, was consulted. Reasons for exclusion at the full-text assessment stage were documented and reported in the PRISMA 2020 flow diagram.

Data Extraction

Data from each eligible study were extracted using a standardized data extraction form. The extracted information included the author(s) and year of publication, participant characteristics and educational level, the Cooperative Learning approach used, study design, social or social-emotional outcomes assessed, and the main findings of each study. The extracted data were used to describe the characteristics of the included studies and to support the narrative synthesis.

Methodological Quality Appraisal

The methodological quality of the included studies was assessed using the Mixed Methods Appraisal Tool (MMAT) 2018 (Hong et al., 2018). Each study was evaluated using the MMAT category and criteria corresponding to its methodological design. Two reviewers independently conducted the appraisal, and any discrepancies were resolved through discussion until consensus was

reached. Each criterion was rated as “Yes,” “No,” or “Can’t tell.” In accordance with MMAT recommendations, appraisal results were not converted into an overall numerical score or percentage.

Data Synthesis

Given the heterogeneity in study designs, participant characteristics, Cooperative Learning approaches, and social outcomes, a meta-analysis was not considered appropriate. Therefore, the findings were synthesized narratively. Social and social-emotional outcomes reported across the included studies were grouped into conceptually related domains, including cooperation, interpersonal skills, communication, responsibility, peer interaction, empathy, emotional regulation, positive interdependence, group processing, promotive interaction, and individual accountability. Patterns of findings were then compared across studies and educational levels.

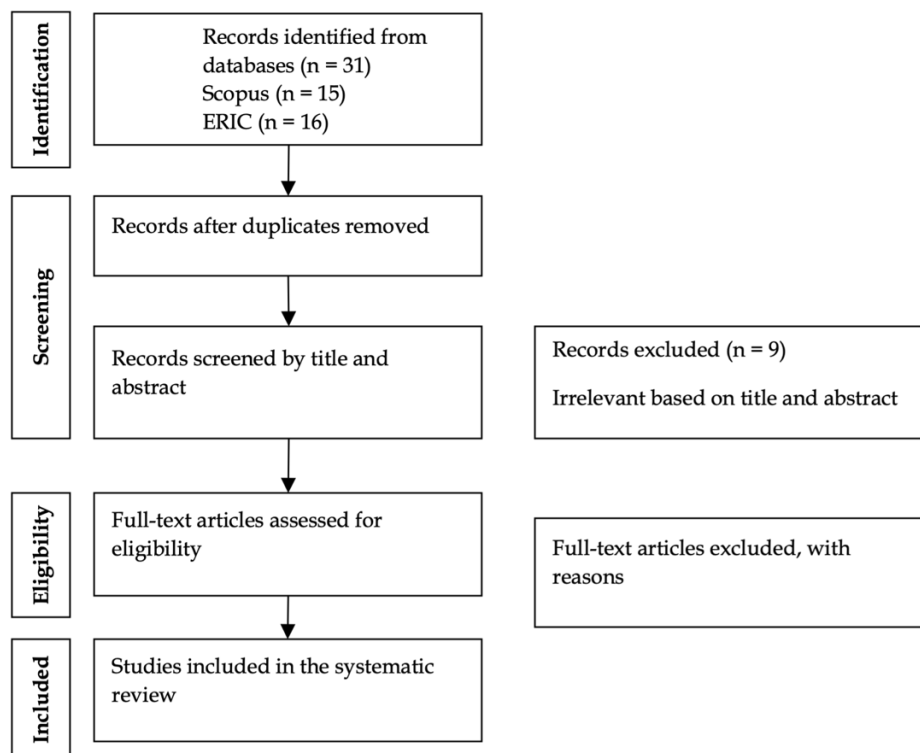


Figure 1. PRISMA flow diagram of the study selection process

Results*Study Selection*

The study identification and selection process followed the PRISMA 2020 framework. Searches of Scopus and ERIC yielded 31 records, including 15 from Scopus and 16 from ERIC. After six duplicate records were removed, 25 records underwent title and abstract screening. At this stage, nine records were excluded because they were not relevant to the scope of the review, leaving 16 articles for full-text assessment. Following evaluation against the predefined eligibility criteria, 10 full-text articles were excluded because they failed to meet one or more inclusion criteria, primarily due to inappropriate study design, the absence of directly assessed social or social-emotional outcomes, or incompatibility of the study context or intervention with Cooperative Learning in physical education. Consequently, six studies met all eligibility criteria and were included in the systematic review (Figure 1).

Characteristics of the Included Studies

Table 1 summarizes the main characteristics of the six studies that met the inclusion criteria. The included studies were

published between 2020 and 2024 and involved participants ranging from primary school to upper secondary or vocational high school. Three studies were conducted with primary school students, while the remaining three involved students at the secondary education level. No studies conducted in higher education settings met all eligibility criteria following full-text assessment.

The included studies employed a range of Cooperative Learning approaches, including general Cooperative Learning models, STAD, and pedagogical approaches that explicitly incorporated core elements of Cooperative Learning. Considerable methodological heterogeneity was observed, with study designs including participatory action research, action research, counterbalanced within-subject interventions, one-group pre-test-post-test pre-experimental designs, and quasi-experimental designs. The social outcomes assessed included cooperation, peer communication and interaction, interpersonal skills, responsibility, empathy, emotional regulation, positive interdependence, group processing, promotive interaction, individual accountability, and global cooperation. The key characteristics and main findings of each included study are presented in Table 1.

Methodological Quality of the Included Studies

The methodological quality appraisal of the six included studies is presented in Table 2. Both qualitative studies met all five relevant MMAT criteria. Among the quantitative non-randomized studies, all studies met the criterion concerning the appropriateness of outcome measurements. However, none fully met the criterion related to participant representativeness. Outcome data were

considered complete in most studies, although this could not be clearly determined for one study. The extent to which potential confounding factors were addressed varied across studies, as did the reporting of intervention fidelity. These findings indicate variability in the methodological rigor of the included studies and should therefore be taken into account when interpreting the overall findings of the review.

Table 1

Characteristics and main findings of the included studies

Study	Participants	CL approach	Study design	Social outcome(s)	Main findings
Bjørke & Mordal Moen (2020)	64 primary school students; Grades 5–6, aged 10–12 years	Cooperative Learning model; multiple CL structures	Participatory action research; qualitative	Social and emotional learning; co-operation; peer support	Sustained exposure to CL facilitated the development of social and emotional skills. Students gradually learned to cooperate, support peers, and work constructively within heterogeneous groups.
Guzmán & Payá (2020)	75 primary school students, aged 10–12 years	Cooperative Learning vs direct instruction	Counterbalanced within-subject intervention	Communication, peer interaction, agreement-making, affiliation	CL produced more communicative behavior among peers and teachers and greater engagement in cooperative behaviors such as discussing activities and reaching agreements.
Rivera-Pérez et al. (2021)	40 primary school students, aged 10–12 years	Cooperative Learning model	One-group pre-test-post-test pre-experimental study	Interpersonal skills, group processing, positive interdependence, promotive interaction, individual accountability, empathy, emotional regulation	After the 8-week CL intervention, all five CL components and global cooperation increased, accompanied by improvements in emotional control/regulation and emotional empathy.
Fernandez-Rio & Casey (2021)	90 secondary school students; Grade 8, mean age 12.42 years	Sport Education with embedded CL elements	Pre-test-post-test quasi-experimental comparison-group design	Interpersonal skills, group processing, positive interdependence, promotive interaction, individual accountability, global cooperation	Students exposed to the pedagogical condition containing sustained cooperative elements showed greater improvements in all five CL components and global cooperation than the comparison group.
Silva et al. (2021)	25 high school students, aged 16–17 years	Cooperative Learning model	Action research; qualitative	Cooperative relationships, communication, responsibility, social learning	CL required sustained implementation and adaptation. Over time, cooperative relationships developed and students assumed greater responsibility for their own and their peers' learning.
Rahmadhanty et al. (2024)	20 Grade 11 vocational high school students	STAD and peer teaching	Quasi-experimental 2 × 2 factorial design	Social skills	Both instructional conditions improved social skills; peer teaching produced greater improvements than STAD, and social-skill outcomes also differed according to learning motivation.

Table 2

Methodological quality appraisal of the included studies using MMAT 2018

Study	MMAT category	C1	C2	C3	C4	C5
Bjørke & Mordal Moen (2020)	Qualitative	Y	Y	Y	Y	Y
Guzmán & Payá (2020)	Quantitative non-randomized	N	Y	CT	Y	CT
Rivera-Pérez et al. (2021)	Quantitative non-randomized	N	Y	Y	N	Y
Fernandez-Rio & Casey (2021)	Quantitative non-randomized	N	Y	Y	Y	Y
Silva et al. (2021)	Qualitative	Y	Y	Y	Y	Y
Rahmadhanty et al. (2024)	Quantitative non-randomized	N	Y	Y	CT	CT

Note. Y = Yes; N = No; CT = Can't tell. For qualitative studies, C1–C5 refer to the appropriateness of the qualitative approach, adequacy of data collection, derivation of findings from the data, substantiation of interpretation, and coherence between data sources, collection, analysis, and interpretation. For quantitative non-randomized studies, C1–C5 refer to representativeness of participants, appropriateness of measurements, completeness of outcome data, accounting for confounders, and intervention/exposure fidelity.

Discussion

Q1. Social Outcomes Associated with Cooperative Learning

Overall, the six included studies indicate that the implementation of Cooperative Learning in physical education is

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associated with the development of a range of social and social-emotional outcomes. The most consistently reported findings relate to cooperation, interpersonal skills, peer communication, group responsibility, and positive interaction during the learning process.

Bjørke and Mordal Moen (2020) showed that sustained implementation of Cooperative Learning gradually helped students develop the ability to work constructively in groups, support their peers, and establish more positive social and emotional relationships. Similar findings were reported by Guzmán and Payá (2020), who found that students in the Cooperative Learning condition communicated more frequently with peers, discussed activities more actively, and were more likely to reach agreements than when they participated in direct instruction.

Rivera-Pérez et al. (2021) reported improvements in the five core elements of Cooperative Learning, namely interpersonal skills, group processing, positive interdependence, promotive interaction, and individual accountability, together with increased global cooperation following the intervention. Improvements were also observed in emotional control and regulation and emotional empathy. Similarly, Fernandez-Rio and Casey (2021) found that students exposed to a pedagogical approach incorporating sustained Cooperative Learning elements demonstrated greater improvements in interpersonal skills, group processing, positive interdependence, promotive interaction, individual accountability, and global cooperation than those in the comparison group.

Silva et al. (2021) showed that the development of cooperative relationships required sustained implementation and continuous adaptation throughout the academic year. Over time, students became increasingly able to communicate, cooperate, and assume greater responsibility for both their own learning and that of their peers. Meanwhile, Rahmadhanty et al. (2024) reported improvements in social skills following group-based instruction in physical education, although the peer-teaching group demonstrated greater improvements than the STAD group.

Taken together, the available evidence suggests that Cooperative Learning has the potential to support the development of social and social-emotional skills in physical education (Johnson & Johnson, 2017). However, these findings should be interpreted with caution given the variability in study designs and the methodological limitations identified through the MMAT appraisal.

Q2. Gender-Related Findings

Evidence regarding gender-related differences in responses to Cooperative Learning remains limited among the studies that met the inclusion criteria. Rivera-Pérez et al. (2021) specifically examined gender differences and found no significant differences between male and female students in the outcomes assessed, either before or after the intervention. The remaining included studies did not provide sufficient comparative gender analyses to determine whether one gender derived greater social benefits from Cooperative Learning.

Accordingly, the evidence available from the studies included in this systematic review is insufficient to conclude that either female or male students consistently demonstrate higher levels of cooperation or greater improvements in social skills following Cooperative Learning in physical education. Gender-related responses should therefore be regarded as an area requiring further investigation using study designs and analytical approaches that explicitly consider gender as a potential moderating factor (Baena-Morales et al., 2020; Cañabate Ortíz et al., 2023).

Q3. Educational Level of the Included Studies

All studies that met the eligibility criteria were conducted among school-aged populations. Three of the six included studies involved primary school students, while the remaining three were conducted at the secondary education level, including lower secondary, upper secondary, and vocational high school settings. Following the application of the predefined eligibility criteria, no studies involving university students met all inclusion requirements.

This distribution indicates that the current evidence on the relationship between Cooperative Learning and social

outcomes in physical education is concentrated primarily within primary and secondary education settings (León et al., 2022). Although several studies across these educational levels reported positive developments in social and social-emotional outcomes, the limited number of studies and the heterogeneity of their designs do not allow firm conclusions regarding whether Cooperative Learning is more effective at one educational level than another. Therefore, these findings should be interpreted as reflecting the current concentration of available evidence rather than demonstrating the superiority of Cooperative Learning for any particular age group or educational level.

Clinical implications

The findings of this systematic review suggest that Cooperative Learning may be a useful pedagogical approach for promoting social and social-emotional development in physical education settings. In practice, physical education teachers may consider incorporating structured Cooperative Learning elements, such as positive interdependence, individual accountability, group processing, and promotive peer interaction, to foster cooperation, interpersonal communication, responsibility, empathy, and peer support. However, implementation should be adapted to the characteristics of the learners and educational context, and sufficient time should be provided for cooperative relationships to develop. Because the current evidence is based on a small and methodologically heterogeneous body of studies, these findings should not be interpreted as establishing superiority over other instructional approaches. Further well-designed intervention studies are needed before firm recommendations can be made regarding the most effective Cooperative Learning format, educational level, or subgroup of students.

Study limitations

This systematic review has several limitations. First, the literature search was restricted to two databases, Scopus and ERIC, and relevant studies indexed in other databases may therefore have been missed. Second, only six studies met all eligibility criteria, limiting the generalizability of the findings. Third, substantial heterogeneity was observed across study designs, participant characteristics, Cooperative Learning approaches, and the social and social-emotional outcomes assessed. This heterogeneity precluded meta-analysis and necessitated a narrative synthesis of the findings. Fourth, the methodological quality appraisal using the MMAT identified limitations in several quantitative studies, particularly with regard to participant representativeness, control of potential confounding factors, and reporting of intervention fidelity. The overall conclusions should therefore be interpreted in light of the methodological quality of the individual studies. Finally, all eligible studies were conducted in primary or secondary education settings, leaving insufficient evidence regarding the effects of Cooperative Learning on social outcomes in higher education contexts.

Conclusions

This systematic review indicates that Cooperative Learning in physical education has the potential to support the development of a range of social and social-emotional outcomes among students. Across the six studies that met the inclusion criteria, the most consistently reported outcomes included cooperation, interpersonal skills, peer communication and interaction, responsibility, positive interdependence, group processing, promotive interaction, individual accountability, as well as social-emotional outcomes such as empathy and emotional regulation. However, evidence regarding gender-related differences remains limited and insufficiently consistent to conclude that either male or female students derive greater social benefits from Cooperative Learning. In addition, all included studies were conducted in primary and secondary education settings, meaning that the findings cannot be used to determine the most effective educational level or be directly generalized to higher education. Future research should employ stronger experimental designs, more representative samples,

clearer reporting of intervention fidelity, and standardized measures of social outcomes to strengthen the evidence regarding the contribution of Cooperative Learning to students' social development in physical education.

Author contributions

Conceptualization: M.A.A.; Methodology: M.A.A.; Investigation: M.A.A.; Data curation: M.A.A.; Formal analysis: M.A.A.; Project administration: M.A.A.; Visualization: M.A.A.; Writing – original draft: M.A.A.; Writing – review & editing: M.A.A. The author has read and approved the final version of the manuscript and agrees to be accountable for the integrity and accuracy of the work.

Ethical statement

Ethical approval was not required for this study because it was a systematic review based exclusively on data from previously published studies and did not involve direct participation of human subjects, collection of identifiable personal information, or any intervention with participants.

Informed consent

Informed consent was not applicable to this study because no primary data were collected directly from human participants. All data analyzed in this systematic review were obtained from previously published studies.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this manuscript, the author used ChatGPT (OpenAI) to assist with language editing, grammar, and readability. The author subsequently reviewed and revised the generated content as necessary and takes full responsibility for the accuracy, integrity, and final content of the manuscript.

Funding

This research received no external funding.

Conflicts of interest

The author declares no conflicts of interest.

Data availability

All data supporting the findings of this systematic review were derived from the published studies included in the review. No new primary datasets were generated or collected. Data extracted for the review are available from the corresponding author upon reasonable request.

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