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The effectiveness of community sports interventions on children's wellbeing: a systematic review and meta-analysis

Lara Vella [a,b], Chathurani De Silva [b], Johannes Carl [c], Matteo Crotti [d], Lisa M. Barnett [c*] and Michael Duncan [a*]

[a]The Centre for Physical Activity, Sport and Exercise Sciences, Coventry University, Coventry, United Kingdom; [b]School of Health and Social Development, Deakin University, Geelong, Australia; [c]Institute for Physical Activity and Nutrition, School of Health and Social Development, Deakin University, Geelong, Australia; [d]Department of Human and Social Sciences, University of Bergamo, Bergamo, Italy

ABSTRACT

Despite lacking broad evidence, sport participation has been suggested to promote wellbeing. The aim of this review was to assess the effectiveness of community sports interventions on children's wellbeing, through the holistic lens of physical literacy (PL). A systematic search of five databases was conducted. Included studies explored community sports interventions aiming to improve children's (4–18 years) wellbeing. From 8,333 eligible articles, 22 studies were included, and quality was assessed using the JBI critical appraisal tools. Data were included for a meta-analysis if wellbeing outcomes included three or more intervention groups and a control group. Effectiveness is reported across seven wellbeing constructs, including enjoyment, quality of life, life satisfaction, self-esteem, physical, mental and emotional wellbeing. A positive intervention effect was found for 16 of 24 wellbeing assessments and meta-analyses highlighted significant improvements on children's quality of life ($t = 5.27$; $p = 0.01$; SMD 0.64). Interventions that focused on team sports, ran between 3–6 months and aligned to all PL domains showed the most significant improvements across all wellbeing outcomes. This review highlights community sport as a favourable setting to improve children's wellbeing. Future research should align the content of interventions to PL principles and foster robust study designs with control group data.

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Physical literacy; Wellbeing; Youth; Physical activity; Community sport

Introduction

Improving children's wellbeing is a growing public health priority. The American Psychological Association (2018) defines wellbeing as 'a state of happiness and contentment, with low levels of distress, overall good physical and mental health and outlook, or

CONTACT Lara Vella vellal@coventry.ac.uk; s223856067@deakin.edu.au
*Joint senior authors.

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good quality of life'. However, many other terms, including 'life satisfaction' and 'quality of life' are often used interchangeably within the literature (Hone et al., 2015). Although a clear conceptualisation of wellbeing remains elusive, most definitions consider wellbeing to (a) be subjective, (b) be multidimensional (encompassing physical, psychological/mental, and social states) and (c) incorporate negative and positive aspects of wellbeing (quality of life, life satisfaction, self-esteem, enjoyment and mental health) and, therefore, it is important to consider wellbeing as a multifaceted concept in the promotion of youth holistic development (Hone et al., 2015; Jarden & Roache, 2023).

Global statistics on child wellbeing are reported inconsistently (Rees et al., 2020). Although life satisfaction and positive affect are considered to typically decline between 10 and 12 years in most countries, particularly among girls (Marquex et al., 2024). Healthcare policies and initiatives have emphasised the importance of increasing physical activity (PA) through sport experiences for improved wellbeing, citing numerous physical, mental and social health benefits as key drivers (Natural England, 2023; Sport England, 2022), including, improved fundamental movement skills (Nery et al., 2023), reduced anxiety and depressive symptoms (Carter et al., 2021), improvements in self-esteem, confidence and motivation (Ávila-García et al., 2021), academic performance (Alvarez-Bueno et al., 2017), and social connectedness (Theodosiou et al., 2021).

Sport has been defined as a casual or organised form of PA which, through team or individual participation, can improve physical fitness, mental wellbeing, social relationships, and support engagement in competitions at all levels (Council of Europe, 2021). Community-based sport has been presented globally by multiple organisations such as UNESCO (2023), Sport England (2022), and the Australian Government (Department of Health and Aged Care, 2024) as a powerful tool to increase and sustain PA, improve wellbeing development, and foster healthier communities through the development of fundamental life skills (Coakley, 2015). Given that many young people globally (4–16 years) participate in some form of organised sport, it offers a favourable setting for wellbeing interventions, with participation rates ranging from 47% in Australia (Clearinghouse for Sport, 2022), 54% in USA (Project Play, 2022) to 91% in England (Statista Research Department, 2023).

Existing systematic reviews tend to focus on sport within physical education (PE) in school settings (Demetriou & Höner, 2012; Piñeiro-Cossio et al., 2021; Rafferty et al., 2016; Rocliffe et al., 2023) or have examined the effect of sport participation on mental health, such as anxiety and depression, rather than on wellbeing (Andermo et al., 2020; Biddle & Asare, 2011; Neill et al., 2020). A review of reviews that aimed to develop recommendations for activity promotion in children has called for a shift away from school-based settings and instead to move towards implementation at the community level, acknowledging the limited capacities and facilities of schools and the incorporation of important stakeholders (Messing et al., 2019). Two systematic reviews have focused on interventions to improve wellbeing in community sports but one only focused on adolescents/young adults and limited the construct of wellbeing and the other only focused on boys. The review on adolescents/young adults examined the effectiveness of sport and dance interventions on subjective wellbeing, aligning the benefits specifically to peer-supported sport and identified a need for more evidence-based, well-designed, group-based interventions within the field (Mansfield et al., 2018). However, the generalisability of the findings to child wellbeing globally is limited, with included interventions focusing on youth (15–24 years), conducted exclusively in high-income countries, and

implemented between 2006 and 2016, which may limit relevance to current contexts. Furthermore, the review reported considerable heterogeneity in assessments and lack of control groups, therefore were unable to provide meta-analytical data to strengthen the quality of findings. The second systematic review of sports-based interventions had an expanded view of wellbeing, which included mental health, but only included interventions involving boys (over 10 years). This review reported significant improvements in 63% of interventions that addressed an outcome of mental health or wellbeing, highlighting promising insights for the value of sporting settings to support child wellbeing (Petersen et al., 2024). Findings also recognise the beneficial role of sports coaches in establishing supportive sporting environments for wellbeing promotion calling for future research to consider the specific content and delivery of interventions (Petersen et al., 2024). Only four of the included interventions were targeted towards improvements in psychological wellbeing, specifically mood and affect, and therefore did not account for the multi-dimensional nature of wellbeing. Given that mental health and wellbeing interventions were grouped for analysis, it is unclear whether overall effects were relevant for mental health rather than wellbeing and therefore further data synthesis is warranted to address this gap in knowledge.

Beyond recommendations to develop sports-based interventions that foster wellbeing, recent attention has turned toward physical literacy (PL) as a comprehensive framework for informing and enhancing these approaches. Conceptualisations of PL amongst countries promoting lifelong PA engagement have acknowledged the physical, social, cognitive, health and wellbeing benefits. For example, Sport England (2023) consensus process outlined PL as 'the degree to which we have a positive and meaningful relationship with movement and PA', aligning closely with the Australian PL framework whereby 'PL involves holistic lifelong learning through movement and PA across four domains (Australian Sports Commission, 2019). The International Physical Literacy Association (IPLA, 2017) has also emphasised the importance of PL development beyond physical competence, for example, cognitive (motivation and competence) and psychological (knowledge) domains, therefore, positioning PL as a useful mechanism for fostering PA and sport participation in young people. Building on these conceptual developments, PL was selected as the guiding framework for this review due to its clear alignment with the multidimensional nature of child wellbeing and its relevance within national sport policy. Unlike other frameworks such as positive youth development (PYD), which focus primarily on psychosocial outcomes (Bruner et al., 2023), PL explicitly incorporates physical, cognitive, affective, and social domains, moving beyond simple motor development, providing a structured and holistic lens through which to evaluate how interventions support children's broader capabilities to be active and well in sport. This domain-based structure offers both conceptual clarity and practical value for analysing community sport interventions. Its suitability is further reinforced by national developments, such as the Sport England (2023) consensus statement, which identifies PL as a central concept for shaping community sport, reflecting a policy-level shift towards integrated, developmentally appropriate approaches.

Cross-sectional research has highlighted that associations between physical literacy (PL) and wellbeing were mediated by sport participation (Melby et al., 2022). Whilst community sport interventions have shown key improvements for child wellbeing (Mansfield et al., 2018), the shift away from fostering solely physical components may have the potential to both enhance youth PL or use elements of PL to support the foundations

of intervention development. Emerging research has highlighted the effectiveness of PL-informed interventions for child wellbeing across physical, cognitive, and psychological domains, although they have primarily centred on school children within PE (Bremer et al., 2018; Carl et al., 2022; Gavigan et al., 2023; Telford et al., 2022). To date, no systematic review has assessed the effectiveness of community sports interventions on the wellbeing of children of all school ages (4-18 years), nor assessed their effectiveness through a PL lens, positioning this review as a timely and novel contribution to the field. This is notable given the theoretical advancement of PL as a multidimensional construct that integrates physical, cognitive, psychological, and social domains, offering a more comprehensive framework for understanding how sport can support youth wellbeing.

Therefore, the aims of this review were threefold: (1) assess the effectiveness of community sport interventions for child wellbeing, (2) review the content and organisation of community sports interventions that were effective in improving child wellbeing, and (3) understand whether interventions that align better with PL were more effective for wellbeing improvements.

Methods

This systematic review was developed in line with the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines 2020 (Supplementary file 1) (Page et al., 2021) and registered on PROSPERO at the protocol stage (CRD42024589072). An effective systematic review, guided by the PICO framework, was chosen to rigorously assess the impact of community sport interventions on child wellbeing, as this review type is designed to synthesise evidence about whether interventions produce measurable outcomes (Munn et al., 2018).

Eligibility criteria

Community sport interventions that included a sport recognised by Sport England and aimed to address child or adolescent wellbeing were included (Sport England, 2024). The eligibility of articles (Supplementary file 2) for inclusion was assessed using the following criteria: (a) interventions were based in a community sport setting (including sports clubs, sports camps, or other community sport spaces), (b) children/adolescents were aged 4–18 years (mean age), (c) participants were typically developing (including children from disadvantaged backgrounds and children living with overweight or obesity), (d) wellbeing was measured quantitatively or qualitatively as an intervention outcome, including enjoyment, happiness, life satisfaction, quality of life, self-esteem and physical, mental, emotional wellbeing (American Psychological Association, 2018; Hone et al., 2015). Articles were excluded if (a) interventions investigated specific populations including, elite athletes, mental health diagnoses, disabilities, neurodiversity or critical illness, (b) were school-led, including PE/ curriculum-based activities, (c) population were pre-school children or adults, (d) were based in hospital, home, clinical church/faith, or orphanage-based settings, (e) outcomes relating to anxiety and depression, (f) concerned review papers, conference abstracts, editor letters, and dissertations. The decision to exclude groups such as children with disabilities, neurodiversity, illness, or mental health diagnoses was made to maintain focus on the general child population in community sport interventions. Interventions

for these groups often differ significantly in design, delivery, and outcomes, warranting separate investigation. Protocol papers meeting the inclusion criteria were deliberately incorporated to provide a comprehensive overview of the current research landscape, including forthcoming studies and methodologies. Their inclusion enhances the depth of the review by offering transparency into study designs (aim 2) and enabling readers to anticipate emerging trends and evidence within the field, thereby supporting the review's objective of mapping both existing and upcoming research directions (Bandara & Syed, 2024). Furthermore, incorporating protocol papers allows for early insight into whether future interventions align with physical literacy (PL) principles and their potential effectiveness (aim 3), thus providing a more holistic understanding of the evolving field.

Search strategy

A literature search was conducted on 4th October 2024 across five databases: Medline, APA PsychINFO, SPORTDiscus, Embase and ERIC, with no restrictions on publication year, but limited to articles published in English. The combination of search terms, Boolean operators and appropriate subject headings was guided by an adapted PICO framework and intended participants (e.g. child), intervention (e.g. sport) and outcome (e.g. wellbeing) were used to develop the search (Supplementary file 3). Reference lists from studies that met the inclusion criteria, along with relevant reviews, were manually searched for potential articles (Mansfield et al., 2018; Petersen et al., 2024).

Study selection and screening

The literature search was facilitated using Covidence management software to enhance collaboration among reviewers (Veritas Health Innovation, Melbourne, Australia). All search hits were exported into EndNote, version x9.3.3, and automatic duplicates were removed.

The systematic review was conducted by a team of researchers, including two postgraduate students and four academics, with expertise in community sports, PL, and systematic review methodology. Following a manual duplicate check by the main author, suitable publications were screened based on title and abstract by the main author and one independent author. Publications that met the eligibility criteria were independently screened for full text following the same procedure. Any discrepancies throughout the screening process were resolved in a discussion with all authors, representative of 7.3% of articles within the full-text screening phase.

Data extraction

One reviewer independently extracted data using an Excel spreadsheet for all included studies and collaborated with another author who independently checked the extraction process. Any disagreements on study inclusion were discussed collectively and resolved between all reviewers. For example, when consensus could not be reached between two independent reviewers, all reviewers met online to make the final decision based on a majority vote. Extracted data included: publication details (author, publication date), setting and population (country, sample size, setting, participant characteristics),

intervention content (study design, facilitator, evaluation type, wellbeing outcomes and measures, study duration and type of community sport), intervention logistics (data collection timepoints and data analysis), intervention findings, assessment and alignment of PL (type and frequency of PL domains investigated as outcomes, measures used, alignment of intervention content to PL) and risk of bias.

Risk of bias assessment in included studies

The Joanna Briggs Institute (JBI) Critical Appraisal tools were used to assess the quality of eligible studies. Three authors independently applied the checklists in line with the appropriate study design, including quasi-experimental, randomized controlled trials (RCT's) and qualitative studies. Where studies explicitly analysed wellbeing outcomes through quantitative and qualitative methods, the appropriate checklists were used to assess the overall quality of the study. Quality items were rated using five outcomes: 'yes', 'no'; 'unclear', 'not reported' or 'not applicable' across all checklists for consistency. In instances where the search produced both the protocol paper and published study, quality assessment was conducted on the published article, using the protocol to provide more thorough details to inform overall study quality. Where checklists reported on the reliability and validity of data collection methods, a 'yes' was only reported if the reference to the instrument was reporting on testing in the target population (children/adolescents). Furthermore, within the RCT checklist, treatment allocation, concealment and blinding were only considered as a 'yes', if an explicit statement was given. Any discrepancies in quality assessment were discussed and managed collectively between the three authors. For protocol papers, only the relevant items within the respective checklists were completed. Therefore, items (7–13 for RCT's and 4–9 for quasi-experimental studies) relating to analysis conducted, follow-up and similarity/comparisons of treatment groups at baseline were scored 'N/A' across all tools.

Data synthesis

Due to the anticipated heterogeneity in outcome measures, study design, and intervention content, a statistical synthesis was only considered where studies were alike in meaningful comparisons, findings were predominantly reported narratively (Gopalakrishnan & Ganeshkumar, 2013). In most parts, synthesis was facilitated by the Synthesis Without Meta-analyses (SWIM) guidelines (Supplementary file 4), and the interventions were grouped based on wellbeing outcomes (Campbell et al., 2020). Intervention effectiveness for outcomes and content was only discussed for studies that reported quantitative wellbeing measures determined by statistical significance ($p < 0.05$), direction of effect (positive, negative or null), and effect sizes, indicated by Cohen's *d*. Where an effect size was not reported, the Psychometrica tool was used to input study data and calculate the effect size (following Klauer's procedure) to provide a standardised measure of the intervention effect and thus facilitate comparisons across studies and address heterogeneity (Lenhard & Lenhard, 2022; McKenzie & Brennan, 2019). Effect sizes were interpreted based on Cohen's guidelines: small (<0.2), medium (<0.5) and large (<0.8) (Cohen, 2013). Where studies included more than one intervention group, these were treated separately in relation to the comparison group. The magnitude of intervention effect was guided by the methodologies of Page et al. (2017). For each wellbeing outcome, where ≤30% of intervention groups reported

an effect, it was coded 'no likely effect' (0), where 31%–60% of studies found significant effects, it was coded an 'unclear effect' (?) and if 61–100% of interventions reported positive or negative improvements it was classified as a 'positive (+)' or 'negative (-)' effect. When four or more intervention groups found an intervention effect (>61%), it was classified as '++' or '–' respectively (Barnett et al., 2022).

The content of interventions was grouped and assessed based on: type of sport (team or individual), type of intervention (sport component or sport and health education elements), study duration (short term: >3months, mid-term: 3–6 months, long-term: more than 6 months), intervention facilitator (sports coaches vs non-sports coaches) and intervention frequency (low frequency: 1x per week; mid-frequency: 2-3x per week; high frequency: more than 3 times per week), and reported in tabular form. Intervention characteristics were selected to capture key aspects of design and delivery relevant to their potential impact on child wellbeing. These were thematically grouped into: (1) intervention content, including type of sport and type of intervention, to explore whether team-based activities or the inclusion of health, education, or wellbeing components were associated with greater improvements; (2) delivery parameters**,** including duration, frequency, and facilitator, to examine how intervention structure and delivery may influence outcomes; and (3) wellbeing outcomes, to assess how wellbeing was defined and measured. This grouping supports the review's aims of assessing effectiveness, understanding how interventions are organised, and exploring alignment with PL principles.

Included studies were also synthesised by how they aligned to the elements within the four domains of PL as outlined in the Australian Physical Literacy Framework (APLF) (Australian Sports Commission, 2019). The APLF was deemed the most appropriate framework of PL to be mapped against intervention content and outcomes as it is the most comprehensive and aligns closely with underlying principles (such as physical competence, motivation and knowledge) included within other national bodies' frameworks for increased generalisability. Studies were grouped by wellbeing outcomes and categorised if interventions (a) explicitly assessed PL as an outcome or (b) implicitly used PL approaches or elements within the content of the intervention. For explicit, outcome-based measures, the element must be clearly listed within the APLF; for example, social cohesion was not included within the social domain, but relationships were, as social cohesion is not one of the listed 30 elements. When assessing the implicit use of PL within intervention content, interventions were categorised based on previous review research as: no alignment (physical domain), poor alignment (physical and one other domain), moderate alignment (physical and two other domains) or strong alignment (included all four domains) (Jerebine et al., 2024).

Meta-analysis

Meta-analyses were facilitated by Review Manager software, version 5.4. (Cochrane, London, UK) (The Cochrane Collaboration, 2020). Exploratory meta-analyses were conducted for wellbeing outcomes that included three or more interventions with a control group to provide direction for future intervention research within the field (Wanner et al., 2020). Based on the anticipated heterogeneity across studies and wellbeing assessments, we conducted a random effects meta-analysis and excluded interventions without a control group, quantitative findings, or insufficient intervention groups investigating a single wellbeing construct. Where studies included more than one

intervention group, they were considered separately against the control group data (size of the control group was split to avoid overpowered calculations). We reported the unadjusted mean and standard deviation post intervention scores (continuous data) for intervention and control groups. Effect sizes (standardised mean difference and Cohen's *d*) (SMD) and associated confidence intervals (95% CIs) were calculated. Adjusted mean scores were also calculated to account for baseline differences between intervention groups. Heterogeneity between groups was computed using the I^2 coefficient, where a value of <25% was considered to not be a meaningful variation between studies. Values around 50% were considerable moderate heterogeneity, and 75% were categorised as considerate heterogeneity between studies (Israel & Richter, 2011). Intervention effects were graphically displayed using forest plots.

Positionality statement

This review is informed by a critical realist perspective, which recognises that wellbeing and PL have real-world effects but are also shaped by context, interpretation, and social processes. As authors, we bring professional experience as coaches across various sports, including swimming, football, and athletics. This stance supports an integrative approach to synthesising diverse evidence while acknowledging the complexity of wellbeing as a multidimensional construct.

Results

Description of selected studies

The search identified 11,034 potential articles for review. After duplicates were removed, 8,333 articles were eligible for screening. Twenty-two articles were included in the analysis, and reasons for exclusion are outlined in the PRISMA flowchart (Figure 1). The search strategy retrieved both the protocol paper and published article for two of the included studies. Therefore, 20 intervention studies (from 22 articles) published between 2005 and 2024 were included in the review.

Study characteristics

A summary of study characteristics is presented in Table 1. A total of 3,923 children and adolescents (6–20 years) (excluding estimated samples from protocols) were included. Based on mean age, 43.8% of studies used a child sample (7–12 years), 50% used an adolescent sample (13–18 years), and one study investigated both. Most of the studies included male and female participants ($n = 12$) (Beaulac et al., 2011; Duda et al., 2013; Fainardi et al., 2021; Ho et al., 2017; Luttenberger et al., 2024; McKenzie et al., 2021; Mutz et al., 2019; Perez-Sousa et al., 2022; Ritchie et al., 2014; Rose-Clarke et al., 2023; Stoner et al., 2013; Warner et al., 2019), three studies included female only (DeBate & Thompson, 2005; Farmer et al., 2020; Sifers & Shea, 2013), four studies included male only (Schweickle et al., 2024; Seabra et al., 2016; Vella et al., 2021; Waters et al., 2022) and one study did not specify participants sex (Perez-Sousa et al., 2020). Two studies offered both mixed and girls-only formats of the intervention (Luttenberger et al., 2024; Warner et al., 2019).

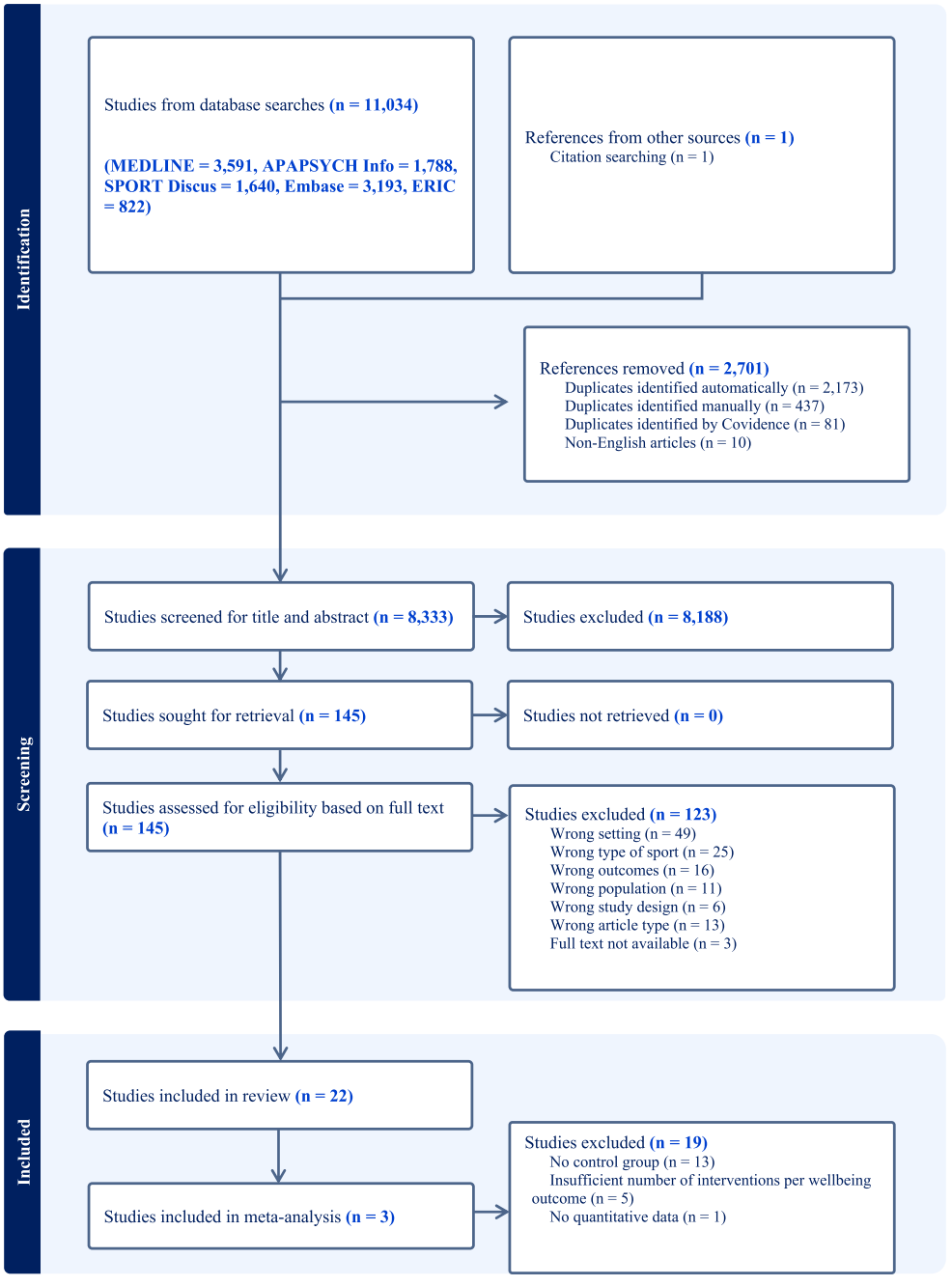

Figure 1. PRISMA (preferred reporting items for systematic reviews and meta-analyses) flowchart.

The review included 16 intervention studies and four protocol papers. Of these, two studies (Schweickle et al., 2024; Vella et al., 2021) reported on the 'Ahead of the Game Programme' and two studies reported on the 'Girl's on the Run Programme' (DeBate & Thompson, 2005; Sifers & Shea, 2013). Therefore, 18 different interventions are discussed,

Table 1. Summary of study characteristics.

Author & Year	Country	Population (sample size, age, sex)	Setting	Study design	Sport	Intervention description	Control	Study duration and frequency	Facilitator	Relevant wellbeing outcome and instrument	Main findings
Beaulac et al., 2011	Canada	SES disadvantaged youth *n* = 14, aged 11–16 years (*M* = 12.5), 11(f), 3(m)	Community recreation centre	Pre-post intervention	Dance	Dance youth programme (Culture Shock Canada – CSC) Content: girls only format or mixed format	No control group	13 weeks 1 × 75 min weekly session	CSC dance instructors	Physical and psychological wellbeing Participant perceptions (qualitative analysis)	Physical wellbeing: Many described improvements in overall health, fitness, strength and energy Mental wellbeing: Most common finding was improved self-confidence and then self-esteem. 50% described improved mood. Some described increased happiness
DeBate & Thompson, 2005	USA	Children *n* = 322, aged 8–13 years (*M* = 10), 322(f), 0(m)	Community sites	Pre-post intervention	Running	Girls on the run programme Content: Training for a 5k event and curriculum-based activity on physical, mental, social health. 3 parts: goal setting, learning skills, community development	No control group	12 weeks 2 × 1 h sessions weekly	Girls on the run coaches	Self-esteem Rosenberg Self-Esteem Scale (RSES)	Self-esteem: Baseline *M* = 21.37 Post *M* = 23.52 $p < 0.05$ A positive statistically significant improvement in self-esteem was found.
Duda et al., 2013	England, France, Spain, Norway, Greece	Children enrolled at soccer clubs *n* = minimum of 50 soccer teams per country m and f to be recruited	Community sports clubs (soccer)	RCT (protocol)	Soccer	Empowering Coaching Education Content: Interactive workshop for coaches to enhance motivation quality of players	Yes Clubs and teams participated in their normal training	1 year No details provided on intervention frequency	Soccer coaches	Wellbeing including enjoyment, life satisfaction and self-esteem Enjoyment/ Importance subscale of the Intrinsic Motivation Inventory Global Self-Esteem Subscale Cantril Ladder of Self-rated Life Satisfaction	N/A (protocol)
Fainardi et al., 2021	Italy	School-aged children *n* = 354, aged 7–13 years (*M* = not reported), 170(f), 184(m)	Summer camp	Pre-post intervention	Athletics, baseball, basketball, football, field hockey, volleyball, rugby, dance, tennis, mountain biking, swimming	2-week activity programme Content: Sports and lab activities combined. 20 different age specific schedules to choose from	No control group	2 weeks 7–10 years = 20-30 h PA plus lab weekly 11–13 years = 23-33 h PA plus lab weekly Total 59 h Total PA = 8.25 h camp daily x5 per week	Professional trainers	Health-related quality of life (including physical wellbeing/ emotional wellbeing and self-esteem) KidKindl® (7–13 years) Kid_KiddoKindl® (7–17 years)	Physical wellbeing: Baseline *M* = 81.8 Post *M* = 82.4 $p = 0.80$ Emotional wellbeing: Baseline *M* = 85.1 Post *M* = 88.6 $p < 0.001$ Self-esteem: Baseline *M* = 66.7 Post *M* = 72.8 $p < 0.001$ Positive significant increases were found in

											children's emotional wellbeing and self-esteem. No significant intervention effect on physical wellbeing
Luttenberger et al., 2024	Lebanon	Community adolescents and Syrian refugees $n = 233$, aged 14–19 years ($M = 16.12$), 90(f), 143(m)	Community space (artificial bouldering wall)	RCT (PCT – pragmatic controlled trial)	Rock climbing	YOUClimb Programme Content: Climbing therapy and experiential education. Session includes introduction, breathing meditation, warm-up and experiential climbing	Yes (waitlist control) Did not participate in any intervention – offered to participate after 8 weeks and completion by the IG	8 weeks 1x 2hr session weekly	CLIMBAID team and climbing instructors	Psychological wellbeing Warwick Edinburgh Mental Wellbeing Scale (WEMWS)	Mental wellbeing: IG baseline $M = 50.49$ IG post $M = 53.6$ CG baseline $M = 49.93$ CG post $M = 49.1$ $p < 0.05$ Positive significant increase in mental wellbeing found as a direct intervention effect
McKenzie et al., 2021	Australia	At risk youth $n = 9$, aged 14–17 years ($M = 14.9$), 8(f), 1(m)	Community space (beach)	Pre-post intervention	Surfing	Waves of wellness programme Content: Early morning ocean surfing combined with psychoeducational mental health discussion	No control group	8 weeks 1x 2hr session weekly made up of 60 mins surfing, 45 mins for discussion	Surf instructors	Self-esteem, emotional wellbeing Rosenberg Self-Esteem Scale (RSES) Participant perceptions (qualitative analysis)	Self-esteem: Inferential statistics not reported due to a lack of power Emotional wellbeing and enjoyment: Participants described improvements particularly on days they engaged with the programme. Emotional states described in line with wellbeing, including increased happiness and life satisfaction
Mutz et al., 2019	France	German speaking adolescents $n = 108$, aged 13–20 years ($M = 17.8$), f and m sample	Summer camp	Pre-post intervention	Choice of canoeing, rock climbing, swimming, hiking, rappelling, cave expedition, canyoneering	Personal development and team building programme Content: Base camp living and sporting activities Participants grouped for analysis into high and low media consumers	No control group	10 days Daily activities	Qualified personal	Subjective wellbeing, measured by long-term life satisfaction and short-term hedonic balance Bradburn Affect Balance Scale (ABS)	Life satisfaction: IG1(high media consumer) Baseline $M = 7$ Post $M = 7.6$ $p = 0.08$ IG2 (low media consumer) Baseline $M = 7.48$ Post $M = 7.55$ $p = 0.538$ Positive significant improvement in life satisfaction for IG1. No intervention effect for IG2

(*Continued*)

Table 1. Continued.

Author & Year	Country	Population (sample size, age, sex)	Setting	Study design	Sport	Intervention description	Control	Study duration and frequency	Facilitator	Relevant wellbeing outcome and instrument	Main findings
Perez-Sousa et al., 2020	Spain	Overweight and obese children $n = 170$, aged 7–11 years ($M = 9.4 + -2.1$ years) sex not reported	Unknown	Pre-post intervention	Soccer, basketball, hockey, athletics	Sports intervention Content: Group PA to teach sports/ social skills and basic multiple fitness	Yes Normal PA	6 months 2 × 1hr sessions weekly	Strength & conditioning technician	Health related quality of life (HRQoL) PedsQL Generic Core Scale	HRQoL: IG baseline $M = 77.8$ IG post $M = 85.9$ CG baseline $M = 82.3$ CG post $M = 81.4$ $p < 0.05$ A positive significant improvement on HRQoL which are significantly mediated by cardio-respiratory fitness and agility
Perez-Sousa et al., 2022	Spain	Overweight and obese children $n = 168$, aged 7–11 years ($M = 9.4 + -2.1$ years) f and m sample	Unknown	Pre-post intervention	soccer, basketball, athletics, running and jumping, hockey	Public physical exercise programme Content: Supervised PA focused on encouraging children to play, physical fitness performance and social skills	Yes Normal PA	6 months 2 × 30 min sessions weekly	Sports science graduate	Health related quality of life (HRQoL) EQ-5D-Y Survey	HRQoL: IG baseline $M = 82.5$ IG post $M = 90.2$ CG baseline $M = 82.5$ CG post $M = 77.1$ $p < 0.05$ A positive significant improvement on HRQoL, including self-perception, usual activities and pain and discomfort. Agility and core strength moderated improvements
Ritchie et al., 2014	Canada	Aboriginal adolescents $n = 73$, aged 11–18 years ($M = 14.6$), 21(f), 38(m)	Summer camp	Pre-post intervention	Canoeing	OALE Programme Content: Intensive programme including wilderness canoe expedition – assigned leadership responsibilities and included ½ day solo practices	Yes Comparison group of aboriginal adolescents who did not participate in OALE	10 days Daily activities	Programme staff	Self-esteem, satisfaction with life Self-Esteem Scale Satisfaction with Life Scale	Self-esteem: Baseline $M = 17.17$ Post $M =$ not reported Satisfaction with life: Baseline $M = 25.97$ Post $M =$ not reported No p value reported No inference testing completed but observable trends showed positive changes at follow up. No significant intervention effects found

Rose-Clarke et al., 2023	Nepal	Adolescents from different communities *n* = 566, aged 12–19 years f and m sample	Community sports grounds	RCT (protocol)	Football, dance, martial arts	SMART intervention Content: Attend as many or few sessions as desired. All sessions include sport and psychological skills training. Sports festivals held throughout intervention and attendance to theatre group performances	Yes Participate in usual sports activities	10 months 2 × 90 min sessions weekly (optional to attend more)	Local sports coaches	Mental wellbeing, self-esteem Warwick Edinburgh Mental Wellbeing Scale (WEMWS) Rosenberg Self-Esteem Scale (RSES)	N/A (protocol)
Seabra et al., 2016	Portugal	Overweight/ obese males *n* = 90, aged 8–12 years (*M* = 10.6), 0(f), 90(m)	Community sports club (soccer)	Non-randomised control design	Soccer	Soccer programme and traditional programme Content: Two intervention groups. Both included nutrition group sessions. Soccer programme included warm up, drills and small-sided games. Traditional programme included endurance, balance-based activities	Yes Activities of normal daily living plus 2 × 1hr nutrition group sessions	6 months 3x 60–90 mins sessions weekly 2x 1hr group nutrition sessions weekly	PE teachers	Self-esteem, health related quality of life (HRQoL) Rosenberg Self-Esteem Scale (RSES) The Pediatric Quality of Life Inventory (version 4.0)	Self-esteem: IG1 – soccer group Baseline *M* = 31.2 Post *M* = 34 *p* = 0.032 IG2 – traditional group Baseline *M* = 29.6 Post *M* = 33.2 *p* = 0.046 CG baseline *M* = 29.8 CG post *M* = 26.6 *p* > 0.05 HRQoL: IG1 – soccer group Baseline *M* = 2.8 Post *M* = 3.2 *p* = 0.008 IG2 – traditional group *Baseline M* = 2.8 Post *M* = 3.2 *p* = 0.039 A significant positive intervention effect for both intervention groups on QoL and self-esteem
Schweickle et al., 2024	Australia	Adolescent males *n* = 816, aged 12–18 years (*M* = 14.6), 0(f), 816(m)	Community sports clubs	Non-randomised control design	Soccer, Australian rules football, rugby league, rugby union, basketball	AHOG 6 module programme Content: Help out a mate workshop after training, internet resilience 'your path to success workshop', 6 internet-based modules	Yes Participate in usual sports activities	3–6 weeks 1 × 45 min weekly help out a mate session weekly 1 × 45 min 'your path to success' session weekly 6 × 15 mins website modules weekly	Research team	Wellbeing Keyes' Mental Health Continuum-Short Form Questionnaire	Mental wellbeing: IG baseline *M* = 66.2 Post *M* = not reported CG baseline *M* = 66.42 CG post *M* = not reported *p* < 0.01 Significant positive intervention effect on wellbeing which was moderated by increases in wellbeing (indirect effect)

(*Continued*)

Table 1. Continued.

Author & Year	Country	Population (sample size, age, sex)	Setting	Study design	Sport	Intervention description	Control	Study duration and frequency	Facilitator	Relevant wellbeing outcome and instrument	Main findings
Sifers & Shea, 2013	USA	3rd–8th grade children $n = 111$, aged 8–13 years ($M = 9.69$), 111(f), 0(m)	Community sites	Pre-post intervention	Running	Running programme Content: Sessions involved a healthy snack, didactic lesson, warm-up, run, cool down. Focus on self-understanding, team building and world improvement	No control group	12 weeks 2x sessions (no duration) weekly	Coaches	Self-esteem, wellbeing Self-Perception Profile for Children	Self-esteem measured by total self-perception: Baseline $M = 118.12$ Post $M = 120.88$ $p = 0.166$ Intervention had no significant effect on self-perception and subsequent self-esteem
Stoner et al., 2013	New Zealand	Maori and Pasifika obese adolescents $n = 14$, aged 14–16 years, m and f to be recruited	Community sports club (boxing)	RCT (protocol)	Boxing	COMPASS Exercise training programme Content: Standard boxing training skipping, shadow, bag work and pad work and progressive resistance training session	Yes Continued with normal exercise	6 months 3 × 70 min sessions weekly, 40 min boxing training and 30 min resistance training	Head boxing coach	Wellbeing BRUMS Measure of total mood disturbance	N/A (protocol)
Farmer et al., 2020	Ireland	2nd–6th grade primary children $n = 137$, aged 8–12 years ($M = 10.75$), 137(f), 0(m)	Gaelic football club	Quasi-experimental	Gaelic football	G4G community sports programme Content: Two intervention groups. Research informed IG-included coach education workshops and resources. Traditional IG – included normal G4G programme	Yes Participate in usual football activities	10 weeks 1 × 60 min session weekly 1 × 10 min FMS practice weekly 1 × 30 min dance practice weekly	Gaelic football coaches	Psychological correlates of PA PA Enjoyment Choices Questionnaire	PA Enjoyment: IG1: $MC = 2.93$ IG2: $MC = 0.18$ CG-:$MC = 0.83$ $p = 0.00$ Statistically significant positive differences in PA enjoyment between IG1 and control. No significant differences for IG2
Vella et al., 2021	Australia	Adolescent community sport participants $n = 350$, aged 12–17 years ($M = 14.53$), 0(f), 350(m)	Community sports clubs	Non-randomised control design	Soccer, rugby league, swimming	AHOG 6 module programme Content: Help a mate workshop after training, internet resilience 'your path to success workshop', 6 internet-based modules	Yes Standard sports programme and training	4 weeks 1 × 45 min weekly help a mate session weekly 1 × 45 min 'your path to success' session weekly 6 × 15 mins website modules weekly	Research team	Wellbeing 14-item Keyes' Mental Health Continuum-Short Form Questionnaire	Wellbeing IG baseline – $M = 69.14$ IG post $M = 74.40$ CG baseline $M = 66.41$ CG post $M = 65.45$ $p = 0.001$ Statistically significant positive differences in mental wellbeing between IG and control.
Warner et al., 2019	Canada	Youth facing barriers $n = 400$, aged 6–29 years f and m sample	Community sites Sports for development facility	Quasi-experimental (pre-post design) (protocol)	Multi-sport, rock climbing, dance, volleyball, hockey, basketball, football, soccer, futsal, rugby	MLSE Sport programme: Content: Sport plus and plus sport programmes available – all include mix of dynamic FMS skills, skill and games of chosen sport, cool down and reflection activity	No control group	2 years Frequency not reported	Sports coaches and programmers	Self-esteem Rosenberg Self-Esteem Scale (RSES)	N/A (protocol)

Waters et al., 2022	Australia	Healthy and high-risk adolescents $n = 251$, aged 12–15 years ($M = 13.12$), 0(f), 251(m)	Community sports club	Non-randomised control design	Rugby	RISE rugby league development programme Content: Group-based workshops with life fit mental health and wellbeing resources	Yes Normal rugby league participation	6 months 1x 30-45 min workshop weekly	Rugby head coaches	Life satisfaction Multidimensional Students' Life Satisfaction Scale	Life satisfaction: IG baseline $M = 4.85$ IG post $M = 4.86$ $p = 0.66$ CG baseline $M = 4.91$ CG post $M = 4.80$ No significant improvement in children's life satisfaction post intervention
Ho et al., 2017	China	Adolescent students $n = 664$, aged 12–13 years ($M = 12.32$), 386(f), 278(m)	Schools (Community centres where schools could not provide a venue)	RCT	Basketball, volleyball and kickboxing	Sports mentorship programme Content: Participants selected the sport they wanted to develop, included a warmup, deliberate sport play, goal setting and skill consolidation	Yes Web-based health education game 90 min log on weekly	18 weeks 1x 90 min sports mentorship session weekly, 1x 45 mins goal setting weekly	Sports coach mentors	Physical and mental wellbeing HRQoL (SF-12v2 – Chinese version)	Mental wellbeing: IG baseline $M = 47.66$ IG post $M = 48.41$ CG baseline $M = 47.16$ CG post $M = 46.15$ $p = 0.001$ Physical wellbeing: IG baseline $M = 49.59$ IG post $M = 51.49$ CG baseline $M = 49.87$ CG post $M = 51.57$ $p = 0.86$ Statistically significant positive differences in mental wellbeing between IG and control. No improvements in physical wellbeing

Note: (f) female, (m) male, M mean, MD mean difference, IG intervention group, CG control group, RCT randomised controlled trial.

including five RCT's (Duda et al., 2013; Ho et al., 2017; Luttenberger et al., 2024; Rose-Clarke et al., 2023; Stoner et al., 2013), four non-randomised control designs (Schweickle et al., 2024; Seabra et al., 2016; Vella et al., 2021; Waters et al., 2022), 10 quasi-experimental studies (pre-post design) (DeBate & Thompson, 2005; Fainardi et al., 2021; Farmer et al., 2020; McKenzie et al., 2021; Mutz et al., 2019; Perez-Sousa et al., 2020; Perez-Sousa et al., 2022; Ritchie et al., 2014; Sifers & Shea, 2013; Warner et al., 2019) and one qualitative design (Beaulac et al., 2011). Intervention studies were conducted across 15 countries, with one intervention targeting five countries (England, France, Greece, Norway and Spain) (Duda et al., 2013). Six studies were conducted in Europe (Fainardi et al., 2021; Farmer et al., 2020; Mutz et al., 2019; Perez-Sousa et al., 2020; Perez-Sousa et al., 2022; Seabra et al., 2016), five studies in Australia/New Zealand (McKenzie et al., 2021; Schweickle et al., 2024; Stoner et al., 2013; Vella et al., 2021; Waters et al., 2022), five in North America (Beaulac et al., 2011; DeBate & Thompson, 2005; Ritchie et al., 2014; Sifers & Shea, 2013; Warner et al., 2019) and three in Asia (Ho et al., 2017; Luttenberger et al., 2024; Rose-Clarke et al., 2023).

Wellbeing outcomes

Fourteen of 16 studies assessed wellbeing using solely quantitative measurement scales. One study adopted a qualitative report of participant perceptions (Beaulac et al., 2011) and one study used a mixed methods approach (McKenzie et al., 2021). Of the 16 intervention studies (excluding protocols), 11 examined multiple outcomes and five examined a single wellbeing outcome. Overall, six studies reported a measurement of self-esteem (DeBate & Thompson, 2005; Fainardi et al., 2021; McKenzie et al., 2021; Ritchie et al., 2014; Seabra et al., 2016; Sifers & Shea, 2013), five reported on mental wellbeing (Beaulac et al., 2011; Ho et al., 2017; Luttenberger et al., 2024; Schweickle et al., 2024; Vella et al., 2021), four reported on quality of life (Fainardi et al., 2021; Perez-Sousa et al., 2020; Perez-Sousa et al., 2022; Seabra et al., 2016), three reported on life satisfaction (Mutz et al., 2019; Ritchie et al., 2014; Waters et al., 2022), three reported on physical wellbeing (Beaulac et al., 2011; Fainardi et al., 2021; Ho et al., 2017), two reported on enjoyment (Farmer et al., 2020; McKenzie et al., 2021) and two reported on emotional wellbeing (Fainardi et al., 2021; McKenzie et al., 2021).

Intervention content

The included interventions featured a variety of different sports, including football ($n = 8$), basketball ($n = 7$), rugby ($n = 5$), dance ($n = 4$), hockey ($n = 4$), climbing ($n = 3$), volleyball ($n = 3$), athletics ($n = 3$), canoeing ($n = 2$) and running ($n = 2$). Swimming, martial arts, futsal, tennis, surfing, boxing, Australian football, orienteering, Gaelic football and rugby union also featured in single studies (all $n = 1$). Collectively (including protocols), 11 interventions focused on one sport and nine interventions offered multiple sport options or ran the intervention across different sports. Of these nine interventions, four interventions allowed participants to choose which sports intervention(s) to participate in (Ho et al., 2017; Mutz et al., 2019; Rose-Clarke et al., 2023; Warner et al., 2019), three interventions required participants to participate in all listed sports (Fainardi et al., 2021; Perez-Sousa et al., 2020; Perez-Sousa et al., 2022) and two interventions recruited participants from their existing sporting clubs but included a range of sports (Schweickle et al., 2024; Vella et al., 2021).

Among the 16 intervention studies with results, 10 included a control group (Farmer et al., 2020; Ho et al., 2017; Luttenberger et al., 2024; Perez-Sousa et al., 2020; Perez-Sousa et al., 2022; Ritchie et al., 2014; Schweickle et al., 2024; Seabra et al., 2016; Vella et al., 2021; Waters et al., 2022), of which four involved participants who continued their usual sports training (Farmer et al., 2020; Schweickle et al., 2024; Vella et al., 2021; Waters et al., 2022), five where participants maintained regular daily activities (Ho et al., 2017; Perez-Sousa et al., 2020; Perez-Sousa et al., 2022; Ritchie et al., 2014; Seabra et al., 2016), with two of these studies also offering a health education resource (Ho et al., 2017; Seabra et al., 2016) and one intervention using a waitlist control (Luttenberger et al., 2024).

Results of risk of bias assessment

RCT's

True randomisation to treatment groups was used or intended in most studies (80%, Supplementary file 5), with all treatment groups similar at baseline (not applicable for protocol papers). However, a clear methodological limitation was the lack of blinding, introducing potential bias. Only 20% of participants, no intervention deliverers and 40% of outcome assessors were blinded to treatment assignment, which may lead to an overestimate of treatment effectiveness for dichotomous outcomes (Pitre et al., 2023). While 75% of studies cited the participatory nature of interventions and use of self-reported measures as reasons for not blinding participants, 50% used alternatives such as blinding outcome assessors. Nevertheless, full blinding was not implemented in most studies (80%), and 40% lacked sufficient detail to assess study quality regarding blinding. All studies (excluding protocols, $n = 2$) treated groups identically, completed follow-up, used appropriate design and statistical analysis and measured outcomes in the same way, although the reliability and validity of outcome measures were only reported for one study.

Quasi-experimental studies

The quasi-experimental JBI checklist was applied to studies using non-randomised pre-post designs (Supplementary file 5). Overall, these 14 studies showed stronger adherence to the JBI criteria than RCT's with all clearly defining variables to establish cause and effect and using consistent assessment methods. Variation in meeting the criteria was mainly related to the use of control groups, with an almost even split of studies using a control group (57%) in comparison to those without (43%). All but one study with a control group adequately described participant matching, particularly demographics (Perez-Sousa et al., 2020). While nearly all studies ($n = 13$) reported follow-up and dropout data, only two (McKenzie et al., 2021; Ritchie et al., 2014) included follow-up beyond post-intervention, limiting assessment of the sustainability and long-term effectiveness of interventions.

Qualitative studies

Assessment for qualitative studies ($n = 2$, Supplementary file 5) met more items on the criteria, showing good overall study quality, with one of the included studies meeting all items and another across all items except for congruity between the researcher's philosophical position and methodology and the researcher's influence.

Assessment of intervention effectiveness by wellbeing outcome

Intervention effectiveness is reported across seven wellbeing constructs, including enjoyment, quality of life, life satisfaction, self-esteem, physical, mental and emotional wellbeing. Some studies included multiple intervention groups/wellbeing outcomes, which are referred to as individual wellbeing assessments throughout and, therefore, feature in Table 2 more than once. From 24 wellbeing assessments reported across 14 intervention studies, with quantitative findings, 16 found a significant positive intervention effect on child and/or adolescent wellbeing (DeBate & Thompson, 2005; Fainardi et al., 2021; Farmer et al., 2020; Ho et al., 2017; Luttenberger et al., 2024; Mutz et al., 2019; Perez-Sousa et al., 2020; Perez-Sousa et al., 2022; Schweickle et al., 2024; Seabra et al., 2016; Vella et al., 2021). All four interventions that measured *mental wellbeing* found a positive significant effect, with three reporting a small effect size (Ho et al., 2017; Schweickle et al., 2024; Vella et al., 2021) and one reporting a medium effect (Luttenberger et al., 2024). In a mental health literacy programme, the positive intervention effect on mental wellbeing was partially mediated by increases in individuals' resilience (Schweickle et al., 2024). Similar findings were echoed in interventions reporting *quality of life*, with all five intervention groups finding a positive significant effect: with three small effect sizes (Fainardi et al., 2021; Seabra et al., 2016) and two large (Perez-Sousa et al., 2020; Perez-Sousa et al., 2022). Of the six studies measuring *self-esteem*, four studies reported a significant positive intervention effect, with two reporting large effect sizes (Seabra et al., 2016), one medium effect (DeBate & Thompson, 2005) and one small effect (Fainardi et al., 2021). A further study measured *enjoyment* across two intervention groups in which a significant positive effect with a large effect size was found only in the research-informed intervention (Farmer et al., 2020). A positive small effect was also found for the only intervention measuring emotional wellbeing (Fainardi et al., 2021). One out of four studies reported a significant positive intervention medium effect for *life satisfaction* (Mutz et al., 2019). This same intervention was replicated across two groups and only high media consumers reported significant benefits in life satisfaction. No studies that assessed physical wellbeing found a positive intervention effect (Fainardi et al., 2021; Ho et al., 2017).

Effectiveness (meta-analysis)

Of the 22 studies, four intervention groups, from three separate studies were included in meta-analyses. Reasons for exclusion include: no control group ($n = 13$), insufficient intervention groups investigating a wellbeing outcome ($n = 5$) and quantitative data not reported ($n = 2$). As only one outcome (quality of life) included sufficient studies reporting quantitative data for both intervention and control groups, no subgroup analyses were conducted between wellbeing outcomes. The constructs, self-esteem, life satisfaction and mental wellbeing were not suitable for meta-analysis due to insufficient quantitative data or a lack of a control group for more than three intervention groups. 302 participants from intervention groups and 128 from control groups were included. A significant positive overall effect of interventions was found on children's quality of life ($t = 5.27$; $p = 0.01$; SMD 0.64, 95% CI 0.25–1.86) (Figure 2). Low to moderate heterogeneity was observed between included interventions, and analyses for heterogeneity were not significant ($\chi^2(3) = 3.84$, $p = 0.28$; $I^2 = 31\%$). Adjusting for baseline differences in the mean did not change the overall pattern substantially.

Table 2. Summary table of intervention effectiveness by wellbeing outcome for interventions using quantitative assessments groups (IG).

Measure of wellbeing	Author	Multiple intervention	Pos effect	Neg effect	Null effect	Percentage of all studies with a positive effect	Significance level (*/**/***)	Cohen's (d)	Effect size
Enjoyment	Farmer et al.,	IG1	x				***	1.03	large
		IG2			x		n.s.	0.21	small
Total Enjoyment						**1/2 (50%)?**			
Quality of life (including HRQL)	Fainardi et al.,		x				*	0.33	small
	Seabra et al.,	IG1	x				**	0.45	small
		IG2	x				*	0.42	small
	Perez-Sousa et al. (2020)		x				***	0.84	large
	Perez-Sousa et al. (2022)		x				***	0.93	large
Total Quality of Life						**5/5 (100%) ++**			
Life satisfaction									
	Ritchie et al.,				x		n.s.	0.06	no effect
	Mutz et al.,	IG1 – low media consumers			x		n.s.	0.09	small
		IG2 – high media consumers	x				**	0.52	medium
	Waters et al.,				x		n.s.	0.18	no effect
Total Life Satisfaction						**1/4 (25%) 0**			
Self-esteem									
	Fainardi et al.,		x				***	0.28	small
	Ritchie et al.,				x		n.s.	0.19	small
	Seabra et al.,	IG1	x				*	1.02	large
		IG2	x				*	1.13	large
	Sifers et al.,				x		n.s.	0.22	small
	Debate et al.,		x				***	0.71	medium
Total Self-esteem						**4/6 (66.6%) ++**			
Physical wellbeing									
	Ho et al.,				x		n.s.	−0.01	no effect
	Fainardi et al.,				x		n.s.	0.04	no effect

(*Continued*)

Table 2. Continued.

Measure of wellbeing	Author	Multiple intervention	Pos effect	Neg effect	Null effect	Percentage of all studies with a positive effect	Significance level (*/**/***)	Cohen's (d)	Effect size
Total						**0/2 (0%) 0**			
Mental/Psychological wellbeing									
	Ho et al.,		x				**	0.25	small
	Vella et al.,		x				**	0.31	small
	Luttenberger et al., 2024		x				*	0.50	medium
	Schweickle et al.,		x				**	0.43	small
Total Mental/Psychological wellbeing						**4/4 (100%) ++**			
Emotional wellbeing	Fainardi et al.,		x				***	0.26	small
Total Emotional wellbeing						**1/1 (100%) +**			
Overall total of studies with a positive effect (%)						**16/ 24 (66.6%)**	**16/24**		

Note**:**
0:no likely effect reported when ≤30% of the intervention groups found changes in the expected direction.
?: uncertain effect reported when 31%–60% of the intervention groups found changes in the expected direction.
+/-: positive or negative effect reported when 61%–100% of the intervention groups found changes in the expected direction.
++/–: classified if four or more studies found a positive or negative intervention effect, respectively.
***:** significance level, $p < 0.05$.
****:** significance level, $p < 0.01$.
*****:** significance level, $p < 0.001$.
n.s.: not significant.
Effect size, Cohen's guidelines: small (<0.2), medium (<0.5) and large (<0.8) [44].
Horizontal lines represent standardised mean difference (Cohen's d) and 95% confidence intervals. Unadjusted and adjusted means are graphically presented. *CI* confidence intervals, *df* degrees of freedom, *IV* inverse variance, *SD* standard deviation.

Assessment of intervention effectiveness by study content

Type of sport and intervention

The type of sport and intervention were important factors associated with positive changes across multiple wellbeing outcomes. All interventions that focused on team sports found a significant positive intervention effect on children's quality of life (Fainardi et al., 2021; Perez-Sousa et al., 2020; Perez-Sousa et al., 2022; Seabra et al., 2016), self-esteem (Fainardi et al., 2021; Seabra et al., 2016), mental and emotional wellbeing (Fainardi et al., 2021; Ho et al., 2017; Luttenberger et al., 2024; Schweickle et al., 2024; Vella et al., 2021). Across all wellbeing measures, 75% found no intervention effect for intervention groups that included individual sports (Ritchie et al., 2014; Sifers & Shea, 2013). Furthermore, studies including both a sporting component and an educational health or wellbeing component showed significant positive effects on children's quality of life (100%) (Seabra et al., 2016), mental and emotional wellbeing (100%) (Fainardi et al., 2021; Ho et al., 2017; Luttenberger et al., 2024; Schweickle et al., 2024; Vella et al., 2021), and self-esteem (75%) (DeBate & Thompson, 2005; Seabra et al., 2016). However, all studies that incorporated only a sport component or other recreational activities, still found a significant positive effect on quality of life (Perez-Sousa et al., 2020; Perez-Sousa et al., 2022). Interventions including an education component had no significant effects on improvements in life satisfaction (Waters et al., 2022) or physical wellbeing (Fainardi et al., 2021; Ho et al., 2017).

Intervention facilitator

Seven interventions were implemented by sports coaches and seven were facilitated by other personnel, including research assistants and PE teachers. Significant positive improvements in children's quality of life and mental wellbeing across all studies were consistent irrespective of the intervention facilitator. Where sports coaches facilitated interventions, a significant positive effect was found in 50% of studies assessing children's enjoyment (Farmer et al., 2020), self-esteem (66.6%) (DeBate & Thompson, 2005; Fainardi et al., 2021) and emotional wellbeing (100%) (Fainardi et al., 2021). However, of the nine intervention groups led by non-sports coaches, seven (77.7%) demonstrated significant positive improvements in children's quality of life (Perez-Sousa et al., 2020; Perez-Sousa et al., 2022; Seabra et al., 2016), life satisfaction (Mutz et al., 2019), self-esteem (Seabra et al., 2016) and mental wellbeing (Schweickle et al., 2024; Vella et al., 2021).

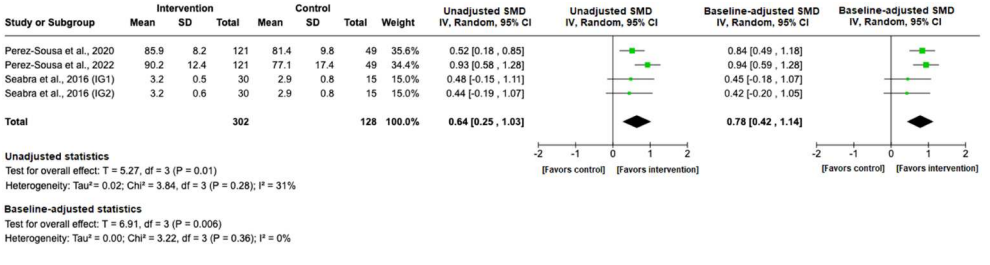

Figure 2. Forest plot of the effect of community sport interventions on children's quality of life.

Table 3. Percentage of analyses by positive, negative and null effect for each wellbeing outcome based on the content of interventions for studies with quantitative findings.

Method of synthesis	Intervention content (%)	Enjoyment				Quality of life				Life satisfaction				Self-esteem				Mental wellbeing				Emotional wellbeing				Physical wellbeing			
		N	+	-	0	N	+	-	0	N	+	-	0	N	+	-	0	N	+	-	0	N	+	-	0	N	+	-	0
Synthesized according to type of sport	Team sports (11)	2	Farmer et al., (IG1) 50%	0	Farmer et al., (IG2) 50%	5	Fainardi et al., Seabra et al., (IG1) Seabra et al., (IG2) Perez-Sousa et al. (2020) Perez-Sousa et al. (2022) 100%	0	0	3	Mutz et al., (high media consumer) 33.3%	0	Mutz et al., (low media consumer) Waters et al., 66.6%	3	Fainardi et al., Seabra et al., (IG1) Seabra et al., (IG2) 100%	0	0	4	Ho et al., Vella et al., Luttenberger et al., Schweickle et al., 100%	0	0	1	Fainardi et al., 100%	0	0	2	0	0	Ho et al., Fainardi et al., 100%
	Individual sports (3)	0	0	0	0	0	0			0	0	0	Ritchie et al., 100%	3	Debate et al., 33.3%	0	Sifers et al., Ritche et al., 66.6%	0	0			0	0	0	0	0	0	0	0	0	0
Synthesized according to intervention type	**Sport's component only** (2)	0	0	0	0	2	Perez-Sousa et al. (2020) Perez-Sousa et al. (2022) 100%	0	0	0	0	0	0	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0

Sport & health/ education/ wellbeing component (9)	2		Farmer et al., (IG1) 50%	0	Farmer et al., (IG2) 50%	2	Seabra et al., (IG1) Seabra et al., (IG2) 100%	0	0	1	0	0	Waters et al., 100%	4	Seabra et al., (IG1) Seabra et al., (IG2) Debate et al., 75%	0	Sifers et al., 25%,	4	Ho et al., Vella et al., Luttenberger et al., Schweickle et al., 100%	0	0	1	Fainardi et al., 100%	0	0	2	0	0	Ho et al., Fainardi et al. 100%,
Sport & other recreational activities (3)	0	0	0	0	1		Fainardi et al., 100%	0	0	3	Mutz et al., (high media consumer) 33.3%	0	Mutz et al., (low media consumer) Ritchie et al., 66.6%	1	Fainardi et al., 100%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Intervention duration	**Short term (<12 weeks)** (7)	2	Farmer et al., (IG1) 50%	0	Farmer et al., (IG2) 50%	1	Fainardi et al., 100%	0	0	3	Mutz et al., (high media consumer) 33.3%	0	Mutz et al., (low media consumer) Ritchie et al., 66.6%	2	Fainardi et al., 50%	0	Ritchie et al., 50%	3	Vella et al., Luttenberger et al., Schweickle et al., 100%	0	0	1	Fainardi et al., 100%	0	0	1	0	0	Fainardi et al., 100%,
	Mid-term (3-6 months) (7)	0	0	0	0	4	Perez-Sousa et al. (2020) Perez-Sousa et al. (2022) Seabra et al., (IG1) Seabra et al., (IG2) 100%	0	0	1	0	0	Waters et al., 100%	3	Debate et al., Seabra et al., (IG1) Seabra et al., (IG2) 66.6%	0	Sifers et al., 33.3%	1	Ho et al., 100%	0	0	0	0	0	0	1	0	0	Ho et al., 100%

(*Continued*)

Table 3. Continued.

Method of synthesis	Intervention content (%)	Enjoyment				Quality of life				Life satisfaction				Self-esteem				Mental wellbeing				Emotional wellbeing				Physical wellbeing			
		N	+	-	0	N	+	-	0	N	+	-	0	N	+	-	0	N	+	-	0	N	+	-	0	N	+	-	0
Long term (more than 6 months) (0)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Intervention frequency (per week)	**Low (1x *p*/w)** (4)	2	Farmer et al., (IG1) 50%	0	Farmer et al., (IG2) 50%	0	0		0	0	1	0	0	Waters et al., 100%	0	0		0	0	2	Ho et al., Luttenberger et al., 100%	0	0	0	0	0	0	1	0	0	Ho et al., 100%
	Mid (2-3x *p*/w) (7)	0	0	0	0	4	Seabra et al., (IG1) Seabra et al., (IG2) Perez-Sousa et al. (2020) Perez-Sousa et al. (2022) 100%	0	0	0	0	0	0		4	Seabra et al., (IG1) Seabra et al., (IG2) Debate et al., 75%	0	Sifers et al., 25%	2	Vella et al., Schweickle et al., 100%	0	0	0	0	0	0	0	0	0	0
	High (3 + *p*/w) (3)	0	0	0	0	1	Fainardi et al., 100%	0	0	3	Mutz et al., (high media consumer) 33.3%	0	Mutz et al., (low media consumer) Ritchie et al., 66.6%		2	Fainardi et al., 50%	0	Ritchie et al., 50%	0	0		0	0	1	Fainardi et al., 100%	0	0	1	0	0	Fainardi et al., 100%

Intervention facilitator	**Sports coaches/ trained instructors** (7)	2	Farmer et al., (IG1) 50%	0	Farmer et al., (IG2) 50%	1	Fainardi et al., 100%	0	0	1	0	0	Waters et al., 100%	3	Fainardi et al., Debate et al., 66.6%	0	Sifers et al., 33.3%	2	Ho et al., Luttenberger et al., 100%	0	0	1	Fainardi et al., 100%	0	0	2	0	0	Ho et al., Fainardi et al., 100%
	Non-sports coaches (7)	0	0	0	0	4	Seabra et al., (IG1) Seabra et al., (IG2) Perez-Sousa et al. (2020) Perez-Sousa et al. (2022) 100%	0	0	3	Mutz et al., (high media consumer) 33.3%	0	Ritchie et al., Mutz et al., (low media consumer) 66.6%	3	Seabra et al., (IG1) Seabra et al., (IG2) 66.6%	0	Ritchie et al., 33.3%	2	Vella et al., Schweickle et al., 100%	0	0	0	0	0	0	0	0	0	0
	Total number of analyses per wellbeing outcome		1	0	1		5	0	0		1	0	3		4	0	2		4	0	0		1	0	0		0	0	2

Note: Number in brackets reflects the number of studies *(n)*, + *significant positive effect*, - *significant negative effect*, 0 *no effect*, *p*/w *per week*.

Intervention duration and frequency

Intervention duration ranged from 10 days-six months with most interventions lasting three months or less (64.3%) (DeBate & Thompson, 2005; Fainardi et al., 2021; Farmer et al., 2020; Luttenberger et al., 2024; Mutz et al., 2019; Ritchie et al., 2014; Schweickle et al., 2024; Sifers & Shea, 2013; Vella et al., 2021). Overall, 73% of mid-term intervention groups (three-six months) highlighted more significant improvements across wellbeing measures in comparison to 62% of short-term interventions (<12 weeks). Mid-term interventions contributed to more significant positive effects on children's quality of life (80%) (Perez-Sousa et al., 2020; Perez-Sousa et al., 2022; Seabra et al., 2016), whereas short-term interventions contributed to greater improvements in children's mental wellbeing (100%) (Luttenberger et al., 2024; Schweickle et al., 2024; Vella et al., 2021).

Studies ranged in frequency from a 45-minute session weekly to up to 8.25 h daily across an intensive sports camps week. The most common reported dose ($n = 7$) was categorised as mid-frequency (two-three times per week) with 86% of interventions highlighting a positive intervention effect on children's quality of life (Perez-Sousa et al., 2020; Perez-Sousa et al., 2022; Seabra et al., 2016), self-esteem (DeBate & Thompson, 2005; Seabra et al., 2016) and mental wellbeing (Ho et al., 2017). High frequency interventions (more than three times per week) were not positively associated with increases in children's life satisfaction, self-esteem and physical wellbeing with 67% ($n = 2$) (Mutz et al., 2019; Ritchie et al., 2014), 50% ($n = 1$) (Ritchie et al., 2014) and 100% ($n = 1$) (Fainardi et al., 2021) of interventions reporting no intervention effects, respectively.

Irrespective of intervention content across sport, type, duration, frequency and facilitator, no significant improvements were found in children's physical wellbeing ($n = 2$) (Fainardi et al., 2021; Ho et al., 2017). To summarise, interventions that focused on team sports, ran over three-six months and included two-three sessions per week showed the most significant improvements across all wellbeing outcomes (Table 3).

Results for qualitative measures of well-being outcomes

Two pre-post interventions reported improvements in children's wellbeing by analysing qualitative perceptions (Beaulac et al., 2011; McKenzie et al., 2021). One study found most participants agreed the programme to be enjoyable and described improvements in emotional states congruent with emotional wellbeing and increases in happiness and satisfaction (McKenzie et al., 2021). Another study assessing physical and psychological wellbeing of participants, reported changes to physical health in many youths and a few improvements in overall health. Furthermore, most children, several parents and all programme staff reported improvements in psychological wellbeing: most commonly self-confidence, self-esteem and mood, as well as overall increases in PA participation (Beaulac et al., 2011).

Assessment of intervention effectiveness through a PL lens

Over half (57.1%) of included interventions assessed an element of PL as an outcome. Seven intervention groups measured physical components (beyond the recognised sport, such as, FMS) (Farmer et al., 2020; Ho et al., 2017; Perez-Sousa et al., 2020; Perez-Sousa et al., 2022), five assessed psychological components (Farmer et al.,

2020; Ritchie et al., 2014; Seabra et al., 2016; Sifers & Shea, 2013), none assessed cognitive components, and one assessed social components (Fainardi et al., 2021) (Supplementary file 6). Elements of PL were explored in all intervention groups that assessed quality of life ($n = 5$) (Fainardi et al., 2021; Perez-Sousa et al., 2020; Perez-Sousa et al., 2022; Seabra et al., 2016) and enjoyment ($n = 2$) (Farmer et al., 2020), five of the six (83.3%) assessing self-esteem (Fainardi et al., 2021; Ritchie et al., 2014; Seabra et al., 2016; Sifers & Shea, 2013), two of the five (40%) assessing physical, mental and emotional wellbeing (Fainardi et al., 2021; Ho et al., 2017) and in one of the four groups (25%) that assessed life satisfaction (Ritchie et al., 2014). Interventions that reported improvements on children's quality of life also highlighted significant improvements within the physical domain of PL, including strength, agility, flexibility and endurance (Perez-Sousa et al., 2020; Perez-Sousa et al., 2022; Seabra et al., 2016). Significant positive improvements in children's self-perception were found in all studies that assessed self-esteem and an element of PL- although congruency in significant improvements across both was only reported in two of three (66%) intervention groups (Seabra et al., 2016; Sifers & Shea, 2013).

The APLF was also aligned to the implicit use of PL elements within the design and content of included sport programmes (Supplementary file 7) (Australian Sports Commission, 2019). Four interventions were classified as not aligned(Fainardi et al., 2021; Mutz et al., 2019; Ritchie et al., 2014; Seabra et al., 2016), three interventions poorly aligned (Luttenberger et al., 2024; Perez-Sousa et al., 2020; Perez-Sousa et al., 2022), four interventions moderately aligned (Farmer et al., 2020; Ho et al., 2017; Sifers & Shea, 2013; Waters et al., 2022), and three interventions were strongly aligned (DeBate & Thompson, 2005; Schweickle et al., 2024; Vella et al., 2021). Of the three interventions that were strongly aligned to the APLF, all showed significant improvements in individual's psychological wellbeing (Schweickle et al., 2024; Vella et al., 2021) and self-esteem (DeBate & Thompson, 2005). Conversely, of the four interventions with 'no alignment', three studies reported no effect on the associated wellbeing outcome (Fainardi et al., 2021; Mutz et al., 2019; Ritchie et al., 2014). Based on the eligibility criteria of interventions to include a sport component, the content of all interventions ($n = 14$) was mapped to the physical domain. Nine of these interventions also included a social component (DeBate & Thompson, 2005; Farmer et al., 2020; Ho et al., 2017; Luttenberger et al., 2024; Perez-Sousa et al., 2020; Perez-Sousa et al., 2022; Schweickle et al., 2024; Vella et al., 2021) and all but one intervention (88.9%) (Sifers & Shea, 2013) found a significant improvement in respective wellbeing outcomes. However, only 42.9% of studies' intervention content could be aligned to the psychological domain (DeBate & Thompson, 2005; Farmer et al., 2020; Schweickle et al., 2024; Sifers & Shea, 2013; Vella et al., 2021; Waters et al., 2022) and 35.7% for cognitive elements (DeBate & Thompson, 2005; Ho et al., 2017; Schweickle et al., 2024; Vella et al., 2021; Waters et al., 2022) (Supplementary file 7).

Discussion

This is the first review to assess the effectiveness of community sport interventions on child and adolescent wellbeing of school-age (4-18 years). We also uniquely mapped the interventions to a recognised PL framework (APLF) across content and outcome

assessment to answer whether those that aligned better to the construct of PL found greater improvements. This is particularly important as it highlights how aligning interventions with a PL framework can strengthen the impact of community sport on youth wellbeing, especially since many interventions implicitly incorporate PL without explicitly acknowledging it. Data were synthesised from 16 interventions and four protocols. Most studies focused on self-esteem ($n = 5$) and mental wellbeing ($n = 5$), with fewer targeting quality of life ($n = 3$), life satisfaction ($n = 3$), physical wellbeing ($n = 3$), emotional wellbeing ($n = 2$) and enjoyment ($n = 1$). Collectively, this review is the first to provide meta-analytical findings on the effectiveness of community sports interventions for improving child wellbeing, offering invaluable insights to guide future sports programmes that consider intervention content and integrate approaches fostering the holistic development of children through PL.

Intervention effectiveness and content

Overall, 16 of 24 assessments of wellbeing reported significant improvements in children and adolescents. All studies reported significant improvements in three child wellbeing constructs, including mental and emotional wellbeing, quality of life, and most studies for self-esteem (66.6%). Our findings show that interventions in the community sport context can be effective for improving wellbeing, similar to findings in school sport that have reported improvements in mental wellbeing (Andermo et al., 2020; Rafferty et al., 2016) and quality of life (Piñeiro-Cossio et al., 2021). However, the present review additionally recognises the inherently complex and multi-dimensional nature of wellbeing, incorporating seven distinct constructs to offer a more comprehensive synthesis than previous reviews (Jarden & Roache, 2023). The inclusion of outcomes such as self-esteem, enjoyment, happiness, and quality of life was informed by the American Psychological Association's broad definition of wellbeing and reflects the most commonly reported indicators within the community sport literature (Mansfield et al., 2018; Petersen et al., 2024). While these outcomes may not fully align with all conceptual models of wellbeing (e.g. Hone et al., 2015), they represent how wellbeing is frequently operationalised in applied intervention research with children and adolescents. Notably, the diversity of wellbeing measures across included studies also underscores a lack of coherence in how wellbeing is conceptualised and assessed, which in turn limited the potential for meta-analytic synthesis across all constructs. Other review findings on boys (over 10 years) within community sport presented significant intervention effects for mental wellbeing (Petersen et al., 2024). However, this prior review primarily focused on interventions targeting broader mental health rather than wellbeing, therefore effects should be interpreted with caution with only two of four interventions assessing mental wellbeing, reporting significant improvements.

Results from our meta-analyses are the first to highlight significant positive improvements in children's quality of life through community sports participation. As only four intervention groups were included across a small sample ($n = 302$), we highlight the exploratory nature of our analysis and further research would be valuable to better establish effects. Importantly, none of the included interventions found a significant negative effect on wellbeing outcomes, positioning community sport as a favourable setting to promote wellbeing and guide interventions. However, factors including the type and

content of interventions may be pivotal for future researchers to consider when designing sports interventions for the most significant improvements in wellbeing. The type of sport and intervention significantly impacted children's wellbeing with all interventions that included team sports and an education component, such as a wellbeing workshop, compared to individual sports without educational sessions, reporting improvements in quality of life, self-esteem and mental and emotional wellbeing. Research suggests that group-based sport interventions with peer-supported elements are fundamental for developing positive wellbeing outcomes in youth (Mansfield et al., 2018). Although, our findings should be considered cautiously given the disproportionate inclusion of team-based interventions in comparison to individual-based sport interventions, specifically running. Furthermore, wellbeing reviews within other settings such as schools have acknowledged the additional benefits of multi-component interventions, specifically those with an educational wellbeing element, for example, 'Help Out a Mate Workshops' (Schweickle et al., 2024; Vella et al., 2021). Our findings report the benefits of such workshops across community settings ($n = 6$), although it is unclear whether the format and delivery of educational components impacts children's wellbeing due to the variety of materials used and therefore future research may consider the role of mediating factors (Rafferty et al., 2016). Furthermore, the variability in control conditions across studies (e.g. usual activities, ongoing sport participation, health education, or waitlist) may have influenced observed intervention effects. This heterogeneity presents a challenge in comparing effectiveness across studies and should be considered when interpreting the findings.

Most interventions lasted between three-six months, with 72% reporting positive significant intervention effects across all wellbeing outcomes. None of the studies included in the quantitative synthesis were classified as long-term and only one study included follow-up data. Recent intervention research has called for more long-term follow-ups to assess sustainability and changes in wellbeing outcomes (Vella et al., 2021). Whilst our review did not locate any interventions with a duration longer than six months, the decision to include protocols facilitated the inclusion of three long-term interventions. Therefore, our review offers insights into the potential of long-term interventions to impact child wellbeing and highlights where future research is moving (Duda et al., 2013; Rose-Clarke et al., 2023; Warner et al., 2019).

Findings from this review have highlighted considerable heterogeneity across intervention type, sport, duration, and frequency. Such variation makes it difficult to attribute the specific elements of interventions which are directly responsible for children's wellbeing improvements within community sport settings. One explanation for this could be the variation in wellbeing outcomes and assessments (Biddle & Asare, 2011). Consistency in scales used to assess wellbeing, as well as terminology used by authors, should be considered to streamline future research. For example, some authors concluded findings on physical/mental wellbeing but used a recognised quality of life scale for assessment, offering difficulties when categorising findings for analysis (Ho et al., 2017). Whilst our research specifically recommends future interventions to include team sports and educational components over 3–6 months, all interventions aiming to improve children's mental wellbeing and quality of life found significant improvements despite variation in intervention design. Alternatively, all interventions on physical wellbeing, found no significant effects, irrespective of intervention content, which was unexpected given the

improvements reported across PL assessments that included objective physical assessments, such as FMS. Future research should consider other factors that may influence the effects on wellbeing, such as the incorporation of coaches, parents and important stakeholders at the multi-component level (Petersen et al., 2024).

Influence of physical literacy

This review is the first to align sport intervention content to PL, with strongly aligned interventions reporting a significant positive effect, specifically for mental wellbeing (Schweickle et al., 2024; Vella et al., 2021) and self-esteem (DeBate & Thompson, 2005). Our findings highlight the important contribution of physical, psychological, cognitive and social components collectively, positioning PL as a positive mechanism to impact children's wellbeing. Therefore, relevant sporting organisations and researchers can use these insights to acknowledge and adopt more holistic approaches in the development of community sport interventions. Whilst 71% of interventions aligned their content to the APLF, none of the included studies explicitly identified their work as a PL-led intervention. This may partly be attributed to the variance in age of included studies, with PL only gaining momentum in research more recently (Hurter et al., 2022). However, it may also highlight a theory-practice disconnect within the community sport setting, which could be attributed to a gap in research concerning educators, teachers and coaches, whereby insufficient knowledge and understanding of PL by those delivering interventions may impact intervention effectiveness (Edwards et al., 2017; Essiet et al., 2024; Hebinck et al., 2023). Furthermore, confusion in terminology has also been recognised amongst educators when it comes to defining and explaining PL (Robinson et al., 2018). Therefore, it may be beneficial for future interventions to not only align across all domains of PL but incorporate an educational component for intervention facilitators on how to foster such approaches to promote child wellbeing. Importantly, some studies explicitly attributed wellbeing improvements to specific coach training (Farmer et al., 2020) which emphasises the critical role of well-trained facilitators in maximising the effectiveness of PL-based interventions and highlights the need for greater focus on coach education in future sport initiatives. Additionally, the lack of clear theoretical rationale in some interventions limited our ability to evaluate how PL was operationalised. This reinforces the need for structured tools, such as the Physical Literacy Interventions Reporting Template (PLIRT) (Carl et al., 2023), which can support more transparent mapping of intervention components to PL domains and ensure more consistent reporting across studies.

Of the 10 interventions that were aligned to two or more domains of PL (including the physical domain), nine were matched to the social domain, with all but one study reporting significant improvements across all wellbeing outcomes (Sifers & Shea, 2013). Social development and support, building relationships and social connectedness have all been exclusively linked within the literature as fundamental elements of sport participation for improvements in children's subjective wellbeing (Hoye et al., 2015; Theodosiou et al., 2021; Won et al., 2025). Research on community football players (5–18 years) has attributed the quality of social relationships among peers and coaches as fundamental for wellbeing improvements and thus future intervention research should continue to focus within team settings, as supported by our findings (Klemola, 2023). Despite

intervention content implicitly aligning to the social domain of PL across nine studies, only one study quantitatively measured actual improvements of social elements and therefore direct improvements in this domain are unclear (Fainardi et al., 2021). Whilst the benefits of designing interventions to promote social development should not be undermined in wellbeing promotion research, the findings of this review highlight a lack of focus on the inclusion of cognitive and psychological elements, with only 42.9% and 35.7% of interventions aligned, respectively. Previous systematic reviews have identified an insufficient number of PL interventions adopting a holistic approach (incorporating all PL domains), specifically when integrating cognitive and psychological domains concerning knowledge, understanding, motivation and confidence (Carl et al., 2022). Therefore, not only may coaches and facilitators be unaware of how to implement PL approaches based on a lack of knowledge and understanding, but our findings also suggest such challenges transpire across to stakeholders and those involved with designing interventions (Hebinck et al., 2023). Existing interventions have highlighted positive effects of PL interventions on some wellbeing constructs, such as enjoyment amongst children in PE, however, our review did not confirm findings across other constructs due to the small number of included studies (Bremer et al., 2018; Clifford et al., 2023; Gavigan et al., 2023; Telford et al., 2022).

The conceptual alignment between PL and wellbeing strengthens its suitability as a guiding framework for sport-based interventions. PL's four domains map closely onto widely accepted dimensions of child wellbeing. For example, the affective and cognitive domains support self-esteem and mental wellbeing; the social domain contributes to a sense of belonging and interpersonal connections; and the physical domain underpins physical competence and health. Notably, Cairney et al. (2019) explicitly position PL as a determinant of mental health, proposing a model in which developing PL contributes to improved psychological outcomes in children and youth. This highlights the potential for PL-informed interventions to produce broad, wellbeing-related benefits and reaffirms the need for consistency in how both PL and wellbeing are conceptualised and measured across future research.

Strengths and limitations

This review is the first to provide meta-analytical findings on the effectiveness of community sport interventions on child and adolescent wellbeing, specifically quality of life. Furthermore, we uniquely assess effectiveness through a PL lens, offering critical insights for coaches and national governing bodies on how to implement interventions to meet the wellbeing needs of children, and outlining gaps to be considered in future intervention planning. The study protocol for the review was pre-registered in PROSPERO and guided by PRISMA and SWIM guidelines. We acknowledge our positionality as researchers, an approach increasingly encouraged yet often underreported in systematic reviews of complex constructs (Pascoe, 2022). While this perspective shaped our interpretation, we recognise that alternative ontological and epistemological positions may yield different insights.

However, due to the heterogeneity between study designs and wellbeing outcomes and assessments, a meta-analysis could not be conducted across all included outcomes and, therefore, more intervention research within specific wellbeing constructs is

warranted with appropriate control groups. Although subgroup analyses by intervention content were also considered, the small number of eligible studies and limited consistency in outcome measures precluded meaningful statistical comparison (McKenzie & Brennan, 2019). Whilst this review demonstrated the importance of individuals' sport engagement for wellbeing benefits by including studies with qualitative evaluation measures; this was not reflected within the statistical synthesis of quantitative studies and thus future reviews may include qualitative meta synthesis/summary approaches (Nye et al., 2016). A further limitation is recognised in the variation in study quality, specifically relating to a lack of control groups for meta-analyses and the robust methodology of interventions, such as RCT's for minimising biases and affording generalisability. Finally, the review excluded grey literature, non-journal articles and non-English publications and therefore may have missed relevant studies and limited generalizability across other geographical locations.

Future research directions and conclusion

Our review highlights community sport as an effective setting for interventions aimed at improving wellbeing in children and adolescents, particularly self-esteem, mental wellbeing, and quality of life. The evidence supports integrating all dimensions of PL into intervention design, with particular emphasis on cognitive and psychological components that contribute meaningfully to wellbeing. These findings align with strategic priorities set by organisations such as Sport England, UNESCO, and the WHO, underscoring the importance of embedding holistic, developmentally appropriate frameworks into youth sport programmes. Future community-based sport research should prioritise investigating the impact of team-based, multi-dimensional interventions, especially those incorporating educational components for both coaches and participants. These approaches are crucial because they help build supportive environments that encourage long-term participation in sport, and they may be associated with improvements in children's physical, mental, and social wellbeing. Additionally, employing rigorous research methodologies, such as randomized controlled trials (RCTs) and matched control groups, is essential to improve study quality and enable subgroup meta-analyses. This will facilitate more precise synthesis of evidence regarding both the effectiveness of interventions on child wellbeing and the specific components that contribute to positive outcomes. While this review focused on the general population of children in community sport interventions, we acknowledge that excluding children with disabilities, neurodiversity, illness, or mental health diagnoses limits the scope of findings. Future systematic reviews could build on this work by specifically examining interventions designed for these groups, whose needs and programme designs may differ substantially. Advancing research in these areas will contribute to developing more effective community sport interventions, maximising their positive impact on child wellbeing and supporting broader public health objectives.

Authors' contribution statement

LV, MD, LB, MC, JC developed the review idea and search strategy. LV ran the searches, and all authors contributed to the screening of articles. Data was extracted by LV and CDS and reviewed by all authors. LV, MD and LB contributed to quality assessment. LV

developed summary and results tables/figures and the initial drafts of manuscripts. LV and JC calculated effect sizes for meta-analysis. LV wrote the full manuscript, and all authors contributed with constructive comments and approved the final version.

Disclosure statement

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Data availability statement

Further information regarding the data reported on in the current study can be requested by contacting the corresponding author (LV), upon reasonable request.

ORCID

Lara Vella http://orcid.org/0009-0003-3900-229X
Chathurani De Silva http://orcid.org/0009-0005-3946-6427
Johannes Carl http://orcid.org/0000-0001-7393-0450
Matteo Crotti http://orcid.org/0000-0002-5018-9724
Lisa M. Barnett http://orcid.org/0000-0002-9731-625X
Michael Duncan http://orcid.org/0000-0002-2016-6580

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