Vol.8, No.2, 2025, pp. 57-70
DOI: https://doi.org/10.32698/03042

Contents lists available at Journal Global Econedu

Journal of Educational and Learning Studies
ISSN: 2655-2760 (Print) ISSN: 2655-2779 (Electronic)

Journal homepage: http://jurnal.globaleconedu.org/index.php/jels

Small-sided game constraints and soccer performance: a systematic review of pitch size, player number, and format effects

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Article Info

Article history:

Received Sep 26th, 2025
Revised Oct 22th, 2025
Accepted Des 01th, 2025

Keyword:

Small-sided games,
Soccer performance,
Pitch size,
Task constraints,
Physical and physiological load

ABSTRACT

Small-sided games, or SSGs, have become a mainstay of modern soccer coaching, yet the field is still fragmented when it comes to how task constraints translate into actual performance. This systematic review set out to synthesise the evidence on how pitch size, player number, and game format influence the physical, physiological, and technical-tactical performance of soccer players, and to pinpoint which design characteristics are most useful for development. The review followed the PRISMA 2020 framework, using a structured Boolean search of Scopus restricted to title, abstract, and keywords. The search turned up 843 records. After removing 15 duplicates, 828 records were screened, 42 full-text reports were assessed for eligibility, and 18 studies ultimately met all the inclusion criteria. Every included study was appraised with the Mixed Methods Appraisal Tool, and the findings were integrated through thematic synthesis. The evidence pointed in a fairly consistent direction: larger pitches and greater area per player amplify locomotor and physiological demand, whereas smaller formats increase technical-action density and neuromuscular load. Bout duration, player number, and rule constraints also modulated internal load and decision-making. For practitioners, the review clarifies dose-response relationships, highlights maturation and playing level as moderating factors, and lays out priorities for standardised, longitudinal, and sex-balanced research.

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Introduction

Few team sports anywhere are practised as widely as soccer. Competitive match play imposes serious physical, physiological, and cognitive demands on players, and those demands have pushed evidence-based training design to the forefront of coaching and sport science (Clemente et al., 2023; Riboli et al., 2023). Modern match analysis, however, shows that performance is not the product of any single quality. It depends on the interplay of high-intensity locomotor activity, repeated accelerations and decelerations, and rapid technical, tactical decision-making under fatigue (Beato et al., 2023b; de Dios-Álvarez et al., 2024). Given the congested competitive calendar, training these qualities in isolation is rarely an option. Coaches increasingly value methods that build conditioning and game-specific skill at the same time. Small-sided games (SSGs) have therefore become a preferred pedagogical and physiological tool, delivering an integrated stimulus that mirrors the representative demands of competition while staying adaptable to different training objectives.

At their core, SSGs are modified soccer games played on reduced pitches with fewer players. What makes them powerful is that the task constraints are manipulable: pitch dimensions, player numbers, rules, goalkeeper presence, and bout structure all shape the physical and behavioural responses that emerge (Farhani et al., 2022; García-Calvo et al., 2021). Alter any of these and the game shifts toward a higher metabolic load, greater technical involvement, or specific tactical behaviours. This adaptability is precisely what attracts practitioners. The flip side is a complex, multidimensional design space in which small changes in configuration produce meaningfully different training outcomes (Coutinho et al., 2022; Younesi et al., 2021). The practical implication is clear: to prescribe SSGs with precision rather than intuition, coaches need to understand how each constraint drives performance.

A substantial body of research has examined SSG responses using time-motion analysis, global positioning system technology, heart-rate monitoring, and perceptual scales (Beato et al., 2023a; Guard et al., 2022). Formats such as 3v3, 4v4, and 5v5 have been compared directly. Studies have also quantified the influence of relative area per player and evaluated the acute internal and external loads elicited by different configurations (Riboli et al., 2022; Santos et al., 2021). Other reviews have combined SSGs with running-based conditioning, positioning these games within broader periodisation strategies (Clemente & Sarmento, 2021; Nayıroğlu et al., 2022). Collectively, the evidence has established SSGs as a legitimate and potent conditioning stimulus, one capable of eliciting match-representative demands.

Recent methodological and technological advances have sharpened the field considerably. High-resolution tracking systems now allow precise quantification of accelerations, decelerations, and speed-zone distributions. Integrated internal-load measures, meanwhile, have clarified the psychophysiological cost of specific formats (Ouertatani et al., 2022; Soylu et al., 2022). In parallel, researchers have combined SSGs with high-intensity interval training, examining whether these games can reproduce worst-case match scenarios and improve bio-motor abilities (Clemente et al., 2022; Daryanoosh et al., 2023; de Dios-Álvarez et al., 2024). Verbal encouragement, ball-touch limitations, and recovery structure have also received close attention. Studies show that even subtle manipulations along these lines can shift the training stimulus (Branquinho et al., 2021; Hammami et al., 2023). The result is that the questions SSG research can credibly address keep expanding.

Despite this progress, an important gap remains: the evidence is fragmented across isolated constraints. Individual studies typically manipulate one or two variables, such as pitch size, player number, or bout duration, within a single population. Comparing effects across studies, or deriving integrated prescription guidance, is therefore difficult (Cherni et al., 2025; Hidalgo-De Mora et al., 2025). Outcomes are also reported using heterogeneous metrics and formats, so the literature offers abundant but poorly consolidated findings. Practitioners are left without a synthesised account of how constraints jointly determine physical, physiological, and technical, tactical responses. This dispersion limits the translation of research into coherent training design.

A second gap is theoretical and methodological. Many studies focus on acute responses within a single session; comparatively few examine longitudinal adaptations. Moderators such as biological maturation, sex, and competitive level are addressed inconsistently (Chatzicharistou et al., 2025; Wang et al., 2024). Male, youth, and short-duration designs predominate, and that constrains generalisability. The scarcity of standardised reporting complicates the appraisal of dose, response relationships (Ferreira-Ruiz & Martín-Tamayo, 2022; Zanin et al., 2021). Without a systematic synthesis that explicitly maps constraints to outcomes across populations, the field risks accumulating findings that cannot be confidently applied.

These gaps justify the present review and lend it urgency. SSGs are becoming increasingly embedded in elite and developmental soccer. Coaches in that context require an evidence-based framework that clarifies which configurations optimise specific performance qualities, and how contextual moderators alter those effects (Arslan et al., 2021; Thapa et al., 2023). A rigorous PRISMA-guided synthesis of recent, high-quality studies is therefore timely. It can consolidate dispersed findings into actionable guidance while exposing the boundaries of current knowledge. Accordingly, this review is organised around three research questions.

RQ1: What small-sided game formats and training characteristics (pitch size, player number, bout duration, and rules) have been used to enhance soccer performance?

RQ2: What are the effects of small-sided games on the physical, technical, tactical, and physiological performance of soccer players?

RQ3: Which small-sided game characteristics (e.g., pitch size, number of players, bout duration, and game rules) are most effective for improving soccer performance?

Method

A systematic literature review was the approach we settled on, largely because it offers a transparent and replicable way to identify, appraise, and synthesise the available evidence on a clearly defined question (Tranfield et al., 2003). To keep selection and reporting bias in check, the whole process ran on a predefined protocol that governed search, screening, appraisal, and synthesis (Liberati et al., 2009). For reporting, we worked from the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement. That framework structured the identification, screening, eligibility, and inclusion phases and standardised how information moved through the review (Page et al., 2021).

The search string itself came together only after the research questions had been broken down with the PICO framework, a step that ensured the key search concepts were picked out systematically. The Population covered soccer (football) players across competitive levels and age categories. The Intervention of interest was participation in small-sided games with manipulated task constraints, namely pitch size, player number, format, bout duration, and rules. The Comparison, in turn, sat between contrasting SSG configurations or, where applicable, alternative training methods. For the Outcome, we focused on physical, physiological, technical, and tactical performance responses. Each PICO element was then turned into a cluster of keywords and synonyms, and those clusters were combined into a Boolean search string applied to the title, abstract, and keyword fields.

("small-sided game*" OR "small sided game*" OR "sided game*" OR "SSG") AND ("soccer" OR "football" OR "association football") AND ("pitch size" OR "pitch dimension*" OR "area per player" OR "player number*" OR "format*" OR "task constraint*" OR "bout duration" OR "physical" OR "physiological" OR "technical" OR "tactical" OR "performance")

Truncation and wildcard operators (e.g., game* to capture "game" and "games"; dimension* to capture "dimension" and "dimensions") were used to broaden retrieval of morphological variants. The field code TITLE-ABS-KEY restricted the search to titles, abstracts, and author/index keywords, improving precision. Limiters were applied for document type (articles), language (English), and publication window (2021-2025) to focus the synthesis on recent, peer-reviewed primary evidence. The string was piloted and refined iteratively: an initial broad string returned an unmanageable volume of tangential records, after which outcome and constraint terms were tightened to improve relevance.

Scopus was used as the primary and authoritative bibliographic database, given its broad coverage of sport science, sports medicine, and physical education journals and its rich, structured metadata. The search was executed and the metadata exported as the review's evidence base. No supplementary databases were used; reliance on a single comprehensive index was accepted as a boundary of the review and is acknowledged in the limitations.

Table 1. presents the inclusion and exclusion criteria applied during screening.

Criterion	Inclusion	Exclusion
Language	English	Non-English
Document type	Peer-reviewed original article	Conference paper, book chapter, editorial, protocol
Publication period	2021–2025	Before 2021
Population	Soccer/football players (any level or age)	Non-soccer sports; non-human
Intervention/Interest	SSGs with manipulated task constraints (pitch size, player number, format, bout, rules)	No SSG manipulation; unrelated interventions
Outcome	Physical, physiological, technical, or tactical performance	Outcomes unrelated to performance
Design	Primary experimental/observational or systematic synthesis directly addressing constraints	Non-empirical commentary; tangential mention only
Accessibility	Full text retrievable	Abstract only / not retrievable

Note. GK = goalkeeper; SSG = small-sided game.

Study selection proceeded in three sequential stages. To begin, we screened the titles and abstracts of all de-duplicated records against the eligibility criteria, setting aside anything clearly irrelevant. Next, the full texts of potentially eligible reports were retrieved and assessed in detail. Studies satisfying every criterion were kept for synthesis. Screening decisions were documented at each stage; where discrepancies surfaced, the full text was re-examined against the predefined criteria until a consistent decision was reached. Inclusion therefore reflected the review protocol rather than reviewer preference. Screening and eligibility assessment were each conducted independently by two reviewers using the predefined criteria in Table 1. Discussion settled most disagreements, and a third reviewer was consulted when consensus could not be reached. Inter-rater agreement at the

title/abstract screening stage was calculated using Cohen's kappa (κ = 0.88]). Data extraction likewise proceeded independently: two reviewers used a standardised template, and discrepancies were cross-checked against the source texts before synthesis.

Quality appraisal was carried out separately from the PICO-based search formulation described in Section 3.2. Each included study was assessed using the Mixed Methods Appraisal Tool (MMAT), version 2018 (Hong et al., 2018), selected for its suitability in appraising the heterogeneous quantitative designs anticipated in this literature. Design classification came first, with each study assigned to one of five categories based on the reported methodology: Quantitative Randomized, Quantitative Non-Randomized, Quantitative Descriptive, Qualitative, or Mixed Methods. The corresponding five-item checklist was then applied, and each item was answered Yes, can't tell/Partial, or No. Where a design did not fit the MMAT categories, for instance a systematic review with meta-analysis, the equivalent JBI critical-appraisal logic was applied and the substitution was noted.

Responses were scored as Yes = 1, Can't tell/Partial = 0.5, and No = 0. Studies meeting at least 60% of criteria (≥3 of 5) were kept. Consistent with MMAT developer guidance, no study was excluded on quality score alone; lower-confidence studies were flagged and weighted accordingly. Inter-rater agreement for this appraisal was substantial to almost perfect (Cohen's κ = 0.86). All 18 included studies cleared the threshold, with total scores ranging from 4.0 to 5.0 of 5 and every study classified as High methodological quality. Table 2 summarises the appraisal.

Table 2. presents the MMAT quality-assessment summary for the included studies.

Author(s), Year	Study Design	Q1	Q2	Q3	Q4	Q5	Total	Category
Clemente F.M. et al. (2023)	Review (JBI)	Yes	Yes	Yes	Yes	CT	4.5/5	High
Segundo J.F.S.N. et al. (2021)	Quant. non-randomized	Yes	Yes	CT	Yes	Yes	4.5/5	High
Castillo-Rodríguez A. et al. (2023)	Quant. non-randomized	Yes	Yes	Yes	Yes	Yes	5/5	High
Cherni B. et al. (2025)	Quant. non-randomized	Yes	Yes	Yes	Yes	Yes	5/5	High
Santos F.J. et al. (2021)	Quant. non-randomized	Yes	CT	Yes	Yes	Yes	4.5/5	High
Farhani Z. et al. (2022)	Quant. non-randomized	Yes	Yes	Yes	Yes	Yes	5/5	High
Farhani Z. et al. (2025)	Quant. non-randomized	Yes	Yes	Yes	Yes	Yes	5/5	High
Hidalgo-De Mora J. et al. (2025)	Quant. non-randomized	Yes	Yes	Yes	Yes	Yes	5/5	High
Ispyrlidis I. et al. (2024)	Quant. non-randomized	Yes	Yes	CT	Yes	Yes	4.5/5	High
Chatzicharistou P. et al. (2025)	Quant. descriptive	Yes	Yes	CT	Yes	CT	4/5	High
Guard A.N. et al. (2022)	Quant. non-randomized	Yes	Yes	Yes	Yes	Yes	5/5	High
Wang L. et al. (2024)	Quant. randomized	Yes	Yes	Yes	Yes	Yes	5/5	High
Qiao W. et al. (2025)	Quant. non-randomized	Yes	Yes	Yes	CT	Yes	4.5/5	High
Jumareng H. et al. (2024)	Quant. randomized	Yes	Yes	Yes	Yes	Yes	5/5	High
Dello Iacono A. et al. (2021)	Quant. randomized	Yes	Yes	Yes	Yes	Yes	5/5	High
Zaharia G. et al. (2023)	Quant. non-randomized	Yes	Yes	Yes	Yes	Yes	5/5	High
Faga J. et al. (2023)	Quant. randomized	Yes	CT	Yes	Yes	Yes	4.5/5	High
Jastrzębski Z. et al. (2025)	Quant. non-randomized	Yes	Yes	Yes	Yes	Yes	5/5	High

Note. Q1–Q5 = MMAT criteria; Yes = 1, CT (Can't tell/Partial) = 0.5, No = 0. High ≥ 80%; Medium 60–79%; Low < 60%. Study 1 (review with meta-analysis) appraised using JBI-equivalent criteria.

For every study that made it into the review, a standardised extraction template captured the author(s) and year, the country tied to the lead author's affiliation, study design, sample characteristics, the SSG intervention or manipulation (pitch size, player number, format, bout duration, and rules), outcome measures, and key findings. We pulled the data straight from the source metadata and full texts so nothing would get lost along the way. Before synthesis, each extracted variable was also checked against the abstracts to confirm it was accurate.

Alongside the qualitative synthesis, we ran a descriptive bibliometric mapping of the corpus. Author keywords were grouped together to build a co-occurrence structure, and the thematic clusters that emerged were visualised to show where the conceptual focus of this literature sits (Figure 4). We also tabulated how publications were spread across years and where lead authors were based geographically. None of this was meant to test causality. The purpose was purely descriptive, to characterise the overall shape of the evidence base.

Because the outcome metrics varied so much across studies, we went with a thematic synthesis approach (Thomas & Harden, 2008). Findings were coded inductively from the extracted data, then grouped into descriptive themes that captured recurring constraints and outcomes, and finally organised into analytical themes mapped to the three research questions. The emphasis throughout was on integration, on spotting convergences, contradictions, and moderators across studies, rather than describing each one in sequence. Once the themes were formed, we checked them against the primary data to make sure they genuinely represented what the included evidence said.

The whole review followed the PRISMA 2020 checklist, both in how it was conducted and how it was reported. The record flow through identification, screening, eligibility, and inclusion is laid out in the PRISMA 2020 flow diagram in the next section (Page et al., 2021). Every bibliographic detail, every count, and every study characteristic was taken from the exported source metadata, which keeps the process transparent and reproducible.

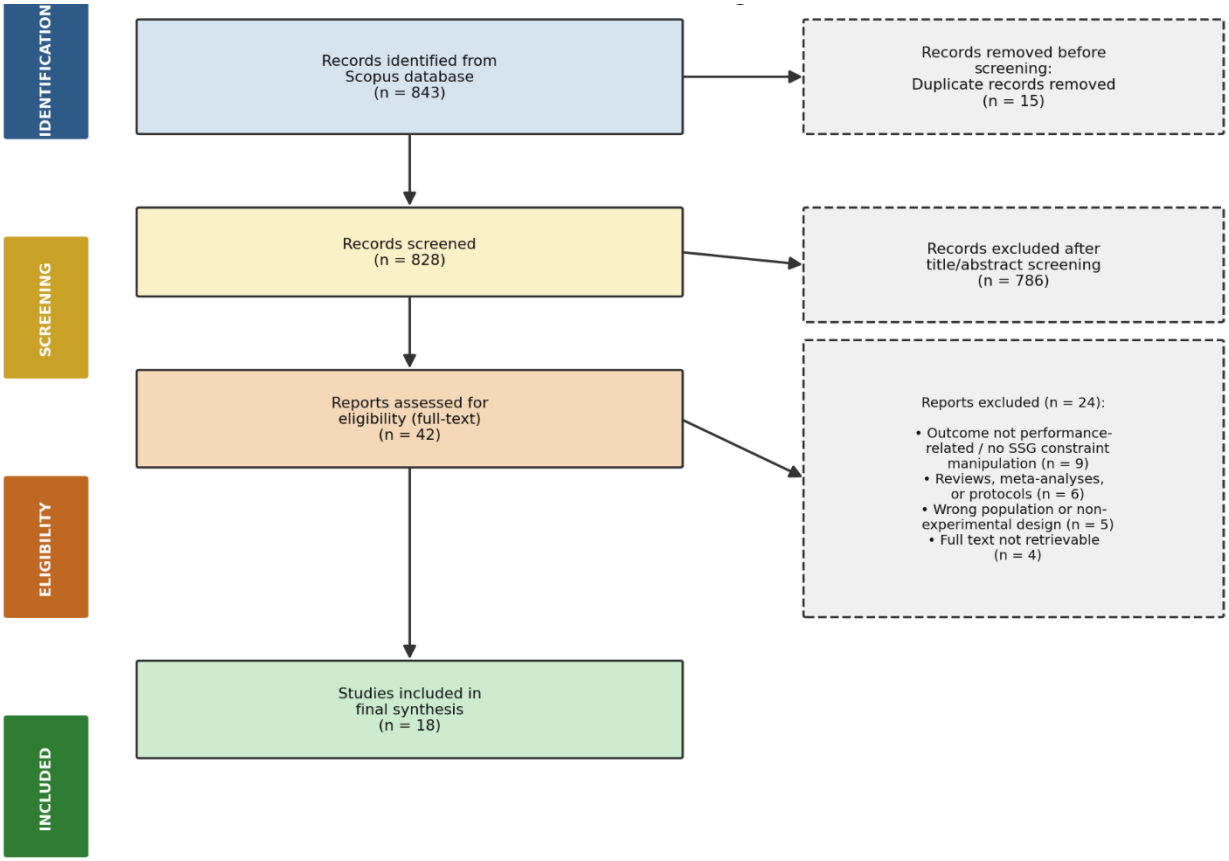

Figure 1. PRISMA 2020 flow diagram of the study identification, screening, eligibility, and inclusion process (adapted from Page et al., 2021).

Results and Discussions

The initial Scopus search returned 843 records. We removed 15 duplicates, which left 828 for title and abstract screening. From there, 786 were dropped, mostly because they weren't directly relevant to small-sided game constraints or performance outcomes. That left 42 full texts to check for eligibility, and 24 ultimately fell out: 9 had outcomes unrelated to performance or involved no SSG constraint manipulation, 6 were reviews, meta-analyses, or protocols rather than primary studies, 5 used an ineligible population or a non-experimental design, and 4 had no retrievable full text. So, 18 studies remained for the final synthesis, and those same counts hold in the abstract, methods, results, and Figure 1.

Publication dates for the 18 included studies run from 2021 to 2025, with output rising over that span and peaking in 2025 (Figure 2). The studies originated from ten countries across Europe, Asia, and the Americas. Tunisia and the United Kingdom contributed the most (Figure 3). Sample populations covered youth, adolescent, collegiate, semi-professional, professional, and elite female players, while the designs included randomised controlled trials, non-randomised crossover and repeated-measures studies, a quantitative-descriptive comparison, and one systematic review with meta-analysis. Table 3 summarises each included study, and Table 4 classifies them by theme and method.

Table 3. presents the summary of included studies.

Title	Author(s)	Year	Country	Key Findings
Effects of pitch size on soccer players' physiological, physical, technical, and tactical responses	Clemente F.M. et al.	2023	Portugal*	Larger pitches and greater area per player increased total distance, high-speed running, and physiological load, whereas

Title	Author(s)	Year	Country	Key Findings
during small-sided games: a meta-analytical comparison				smaller pitches raised the frequency of technical actions and acceleration/deceleration density.
Tactical rule and pitch size change the physical and technical performance of young soccer players during small-sided games	Segundo J.F.S.N. et al.	2021	Brazil	Goal-scoring with goalkeepers and rectangular pitches elevated running output relative to ball-possession and square formats; tactical rule and pitch shape jointly modulated physical and technical performance in U12 players.
The Influence of Pitch Dimensions during Small-Sided Games to Reach Match Physical and Physiological Demands on the Youth Soccer Players	Castillo-Rodríguez A. et al.	2023	Spain	The largest area per player (250 m²) most closely reproduced official match physical and physiological demands in U19 players, while smaller areas under-stimulated high-intensity running.
Physiological, technical, and time-motion responses according to small-sided game formats and pitch size variations in adolescent male soccer players: effects of biological maturity status	Cherni B. et al.	2025	Tunisia	SSG format and pitch size altered time-motion, physiological, and technical responses; biological maturity moderated outcomes, with post-PHV players producing greater high-intensity outputs.
Physiological and physical effect on U-12 and U-15 football players, with the manipulation of task constraints: Field size and goalkeeper in small-sided games of 4x4 players	Santos F.J. et al.	2021	Portugal	Manipulating field size and goalkeeper presence produced age-dependent physiological and physical responses, with distinct load profiles between U12 and U15 players.
Bout duration and number of players of soccer small-sided games affect perceived enjoyment, physiological responses, and technical-tactical performance	Farhani Z. et al.	2022	Tunisia	Shorter, more frequent bouts (3×4 min) and 3v3 increased %HRpeak, blood lactate, RPE, and enjoyment relative to longer bouts and 4v4, showing that format and bout duration jointly shape internal load and technical–tactical output.
Optimizing the number of players and training bout durations in soccer small-sided games: Effects on mood balance and technical performance	Farhani Z. et al.	2025	Tunisia	Optimising player number and bout duration (3v3, 3×4 min) improved mood balance and technical performance-successful passes, tackles, and duels-versus 4v4 and longer bouts.
Effects of pitch size and set configuration on mechanical responses and fatigue induced by different small-sided games in soccer	Hidalgo-De Mora J. et al.	2025	Spain	Larger pitches and shorter bouts imposed higher external mechanical load; sprint acceleration was impaired after every SSG, most markedly after large-pitch, short-bout games.
Physical performance and technical-tactical aspects in 4 vs. 4 small-sided games across various field formats among professional soccer players	Ispyrlidis I. et al.	2024	Greece	Larger field formats (full > half > quarter pitch) increased physiological demand and altered technical–tactical actions in professional 4v4 games.
Small-sided games (ssg) internal and external load on different pitch sizes in young elite women football players	Chatzicharistou P. et al.	2025	Greece	Larger pitches (greater relative area) increased total distance, speed-zone distances, and heart-rate load versus smaller pitches in elite young female players.
The influence of relative playing area and player numerical imbalance on physical and perceptual demands in soccer small-sided game formats	Guard A.N. et al.	2022	United Kingdom	Increasing relative playing area raised cardiovascular, mechanical, and perceptual demands, and numerical imbalance further modulated loading in elite youth SSGs.
Can The Pitch Dimension Influence the Physical Fitness Adaptations Induced by Small-Sided Training Programs Added to Regular In-Field Training? A Randomized Controlled Study in Youth Soccer Players	Wang L. et al.	2024	China	An eight-week SSG program on more elongated pitches produced superior physical-fitness adaptations compared with less elongated pitches when added to regular in-field training.

Title	Author(s)	Year	Country	Key Findings
Higher Heart Rate Intensity Can Negatively Impact Tactical Decision-Making and Technical Accuracy in Small-Sided Games: A Study on The Effects of Field Size and Scoring Method Manipulation	Qiao W. et al.	2025	China	Larger field size and scoring-method manipulation raised psychophysiological intensity; higher heart-rate intensity was associated with poorer tactical decision-making and technical accuracy.
Small Sided Games 3vs3 Goalkeeper-Encouragement: Improve the Physical and Technical Performance of Youth Soccer Players	Jumareng H. et al.	2024	Indonesia	Eight-week 3v3 SSG with goalkeeper-encouragement improved sprint, agility, and aerobic capacity plus technical skills more than standard 3v3 SSG.
Comparative Effects of Game Profile-Based Training and Small-Sided Games on Physical Performance of Elite Young Soccer Players	Dello Iacono A. et al.	2021	United Kingdom	Both SSG and game-profile-based training improved physical performance in elite youth over eight weeks, confirming SSG as an effective in-season conditioning stimulus.
The Effects of 8 Aerobic Endurance Training Weeks of 4vs.4+GK Small-Sided Games versus Traditional Training on Physical Fitness and Skills among U18 Football Players	Zaharia G. et al.	2023	Romania	Eight-week 4v4+GK SSG improved VO2max, sprint, and skills comparably to-or beyond-traditional aerobic endurance training in U18 players.
Does size matter? Effects of small versus large pitch small-sided game training on speed and endurance in collegiate soccer players	Faga J. et al.	2023	United Kingdom	Large area per player improved endurance while small area per player favoured speed adaptations, indicating that area per player directs the training-adaptation profile.
Effects of Eight-Week Game-Based High-Intensity Interval Training Performed on Different Pitch Dimensions on the Level of Physical Capacity and Time-Motion Responses in Youth Soccer Players	Jastrzębski Z. et al.	2025	Poland	Eight-week game-based HIIT on different pitch dimensions improved physical capacity and time-motion characteristics, with the larger pitch eliciting a greater aerobic stimulus.

Note. Country reflects the affiliation of the lead author; * indicates a multinational meta-analysis.

Table 4. classifies the included studies by research design, thematic focus, intervention/manipulation, and outcome.

Author(s)	Year	Research Design	Theme/Focus	Intervention/Manipulation	Outcome
Clemente F.M. et al.	2023	Systematic review with meta-analysis	Pitch size / relative area per player	Smaller vs. larger pitch (area per player)	Physiological, physical, technical, tactical responses
Segundo J.F.S.N. et al.	2021	Quantitative non-randomized (crossover)	Tactical rule + pitch shape	Ball-possession vs. goal-scoring; square vs. rectangular pitch	Running performance, technical skills
Castillo-Rodríguez A. et al.	2023	Quantitative non-randomized (intervention)	Pitch dimension vs. match demands	Small (50 m²) vs. medium (150 m²) vs. large (250 m²) area per player	Physical and physiological match reproduction
Cherni B. et al.	2025	Quantitative non-randomized (crossover)	Format, pitch size, maturation	3- vs. 4-a-side on regular vs. large pitches across maturity groups	Time-motion, physiological, technical responses
Santos F.J. et al.	2021	Quantitative non-randomized (crossover)	Task constraints across age	Field size and goalkeeper presence in 4v4	Internal and external load
Farhani Z. et al.	2022	Quantitative non-randomized (crossover)	Bout duration + player number	1×12, 2×6, 3×4 min at 3v3 and 4v4 with goalkeepers	Enjoyment, %HRpeak, lactate, RPE, technical-tactical
Farhani Z. et al.	2025	Quantitative non-randomized (crossover)	Player number + bout duration	1×12, 2×6, 3×4 min at 3v3 and 4v4 with goalkeepers	Mood state, technical performance

Author(s)	Year	Research Design	Theme/Focus	Intervention/Manipulation	Outcome
Hidalgo-De Mora J. et al.	2025	Quantitative non-randomized (crossover)	Pitch size + set configuration	7v7+GK on large vs. small pitch; long vs. short bouts	Mechanical load, residual fatigue
Ispyrlidis I. et al.	2024	Quantitative non-randomized (repeated measures)	Field format in professionals	4v4+GK on full, half, and quarter pitch	Physiological performance, technical-tactical actions
Chatzicharistou P. et al.	2025	Quantitative descriptive (comparative)	Pitch size in elite women	4v4 on 20×30 m vs. larger pitch	Internal and external load
Guard A.N. et al.	2022	Quantitative non-randomized (crossover)	Relative area + numerical imbalance	Small/medium/large relative area with balanced vs. unbalanced numbers	Physiological, mechanical, perceptual load
Wang L. et al.	2024	Quantitative randomized (RCT)	Pitch elongation + adaptations	8-week SSG on elongated (2.0) vs. less-elongated pitches	Physical-fitness adaptations
Qiao W. et al.	2025	Quantitative non-randomized (repeated measures)	Field size + scoring method	3v3 at three pitch sizes and scoring conditions	Intensity, tactical decision-making, technical accuracy
Jumareng H. et al.	2024	Quantitative randomized (RCT)	Rules / verbal encouragement	8-week 3v3 with goalkeeper-encouragement vs. standard 3v3	Physical fitness and technical skills
Dello Iacono A. et al.	2021	Quantitative randomized (RCT)	SSG vs. game-profile training	8-week 5v5 SSG vs. game-profile-based training	Physical performance
Zaharia G. et al.	2023	Quantitative non-randomized (two-group experimental)	SSG vs. traditional endurance	8-week 4v4+GK SSG vs. aerobic endurance training	VO2max, sprint, skills
Faga J. et al.	2023	Quantitative randomized (RCT)	Area per player + adaptation	4-week 5v5 SSG on large (300 m²) vs. small (75 m²) area per player	Speed and endurance
Jastrzębski Z. et al.	2025	Quantitative non-randomized (randomized allocation)	Game-based HIIT + pitch size	8-week 5-a-side HIIT on 90 vs. 180 m² area per player	Physical capacity, time-motion

Note. QNR = quantitative non-randomized; RCT = randomized controlled trial; QD = quantitative descriptive.

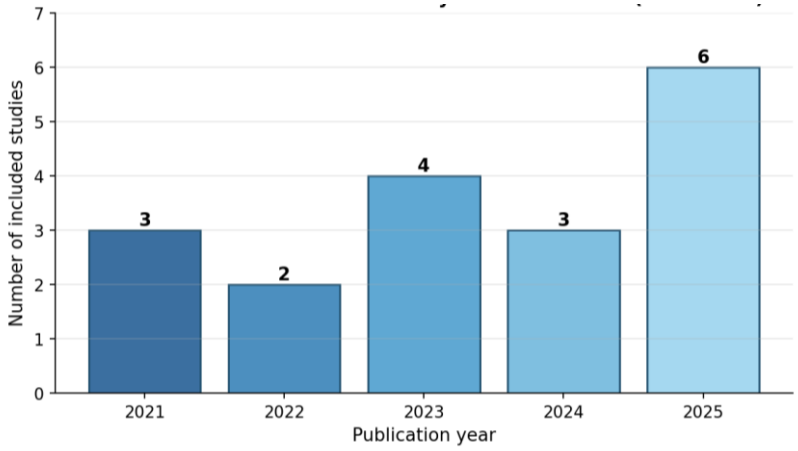

Figure 2. Distribution of the 18 included studies by publication year (2021–2025).

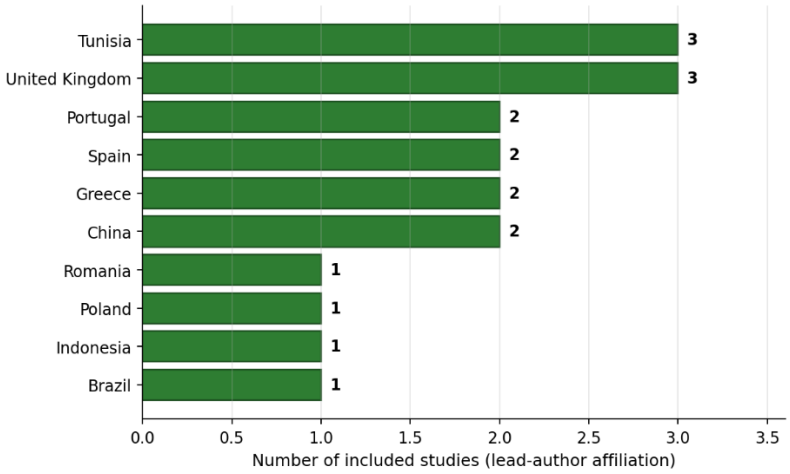

Figure 3. Geographic distribution of included studies by lead-author affiliation.

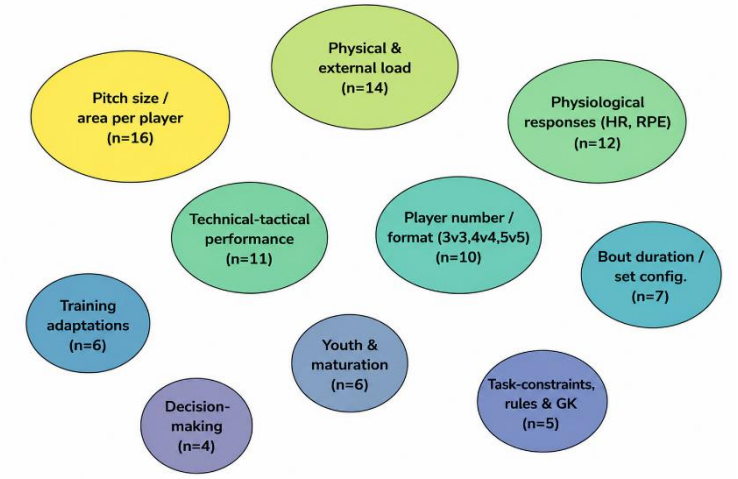

Figure 4. Thematic clusters and keyword co-occurrence across the included studies (bubble size reflects frequency).

Across the included studies, a well-defined repertoire of SSG configurations was used to develop soccer performance, and four manipulable characteristics kept recurring: pitch size and area per player, player number and format, bout duration and set structure, and rule constraints. Of these, pitch size was examined most often, whether expressed as absolute dimensions or as relative area per player. Values ran from tightly compressed spaces of roughly 50 to 97 m² up to expansive areas of 250 to 300 m² (Castillo-Rodríguez et al., 2023; Faga et al., 2023; Hidalgo-De Mora et al., 2025). Formats covered 3v3, 4v4, 5v5, and larger 7v7 games, frequently with or without goalkeepers, and in several designs numerical imbalance was introduced to push the game toward attacking or defensive demands (Guard et al., 2022; Ispyrlidis et al., 2024). Taken together, this diversity suggests that modern SSG prescription is less about a single standardised drill and more about designing constraints.

Temporal structure and rules were just as prominent as spatial and numerical constraints, if not more so. Bout duration, for instance, was systematically compared across continuous and intermittent schemes, typically 1×12 min, 2×6 min, and 3×4 min, to manipulate density and recovery (Farhani et al., 2022; Farhani et al., 2025). Rule changes also mattered: ball-possession versus goal-scoring objectives, modified scoring methods, and goalkeeper-encouragement all reshaped how the game unfolded (Qiao et al., 2025; Segundo et al., 2021). A number of studies went further and embedded SSGs in multi-week programmes, measuring chronic adaptation against traditional endurance training or game-profile-based conditioning (Dello Iacono et al., 2021; Zaharia et al., 2023). That aligns with earlier syntheses that combined SSGs with running-based methods; the shared conclusion is that SSGs work as a flexible, integrative stimulus that can be adapted across the training week, even for the compensatory conditioning of non-starting players (Clemente & Sarmento, 2021; Clemente et al., 2024; Nayıroğlu et al., 2022). So in answer to RQ1, the literature points to a coherent, manipulable design space where pitch size, player number, bout structure, and rules serve as the principal levers for targeting soccer performance.

Across the whole corpus, spatial constraints were the strongest and most consistent driver of SSG physical and physiological responses. Make the pitch bigger, or give each player more relative area, and total distance, high-speed running, and cardiovascular load all climb reliably. Compress the space and locomotor output drops, but acceleration and deceleration density rise along with neuromuscular demand (Clemente et al., 2023; Guard et al., 2022). Studies that benchmarked SSGs against competitive match play reinforced this pattern: reproducing match-level physical and physiological demands required larger areas per player, which implies that undersized formats may under-stimulate high-intensity qualities (Castillo-Rodríguez et al., 2023; Chatzicharistou et al., 2025). Bout structure interacted with these effects as well. Shorter, more frequent bouts intensified internal load, blood lactate, and perceived exertion compared with longer continuous bouts, and they also shaped residual neuromuscular fatigue and subsequent sprint capacity (Farhani et al., 2022; Hidalgo-De Mora et al., 2025). Together these findings sketch a robust dose-response logic in which space and time directly determine the physiological stimulus.

Technical and tactical outcomes were measured less uniformly, yet they exposed an important trade-off with physical loading. Smaller pitches and fewer players boosted the frequency of technical involvements and quickened decision-making; larger spaces, by contrast, allowed more expansive tactical actions but gave each player fewer touches (Ispyrlidis et al., 2024; Segundo et al., 2021). There is a critical caveat here. As psychophysiological intensity climbed, tactical decision-making and technical accuracy deteriorated, so chasing maximal physical load without managing intensity can undermine skill execution (Qiao et al., 2025). Rule and encouragement manipulations pushed behaviour in predictable directions too. Goal-scoring objectives and goalkeeper-encouragement raised engagement and skill output, while format choice shifted mood and enjoyment alongside performance (Farhani et al., 2025; Jumareng et al., 2024). Chronic interventions confirmed that these acute effects translate into genuine adaptation: multi-week SSG programmes improved aerobic capacity, sprint, agility, and skill to a degree comparable with, or greater than, traditional training (Dello Iacono et al., 2021; Jastrzębski et al., 2025; Zaharia et al., 2023). To answer RQ2, SSGs produce broad and largely predictable effects across performance domains, but physical and technical-tactical outcomes are coupled and sometimes compete, so deliberate balancing is needed.

Methodologically speaking, the corpus leans heavily on acute, within-subject crossover and repeated-measures designs. These work well for isolating the effect of a single constraint, but they limit what can be said about longitudinal adaptation and ecological training programmes (Cherni et al., 2025; Santos et al., 2021). A smaller set of randomised controlled trials offered the strongest evidence on chronic effects, showing that pitch geometry and format meaningfully steer fitness adaptations over four to eight week cycles (Faga et al., 2023; Wang et al., 2024). Measurement relied heavily on global positioning systems and heart-rate monitoring. Those tools quantify external and internal load robustly, yet they capture technical and tactical behaviour far less consistently, which helps explain why skill-based outcomes remain relatively underdeveloped (Beato et al., 2023b; Younesi et al., 2021). Over the review window, one can discern a gradual move toward integrating internal-load, neuromuscular, and behavioural measures within single designs, although standardisation of area-per-player reporting and outcome metrics is still incomplete (Riboli et al., 2022; Riboli et al., 2023). This methodological profile goes a long way toward explaining both the confidence attached to the physical findings and the comparative fragility of the technical-tactical evidence.

Read together, the evidence points to a constraints-led view of small-sided games: spatial, numerical, temporal, and regulatory manipulations all systematically reshape the training stimulus. Locomotor and physiological demand scale up consistently as area per player increases, while compressed spaces push technical density and neuromuscular loading in the opposite direction. That trade-off implies no single configuration is universally optimal. The choice has to be matched to the quality being targeted (Clemente et al., 2023; Hidalgo-De Mora et al., 2025). In the end, this reframes SSGs less as a generic conditioning tool and more as a tunable system whose output depends predictably on its constraints.

The theoretical contribution is clear enough. These findings extend representative-design and ecological-dynamics perspectives by demonstrating that manipulating task constraints reliably steers emergent performance behaviour. Intensity and skill, on this account, are coupled outcomes rather than independent targets (García-Calvo et al., 2021; Qiao et al., 2025). One finding challenges the assumption that harder is always better. Excessive psychophysiological intensity can degrade decision-making, so the evidence instead supports an optimal-loading framework in which skill acquisition and physiological stress are jointly optimised (Coutinho et al., 2022; Soylu et al., 2022). The upshot is that SSG design now sits within a broader theory of representative learning environments.

For practitioners, the synthesis translates into fairly concrete choices. Coaches aiming to maximise aerobic and high-intensity running should prescribe larger areas per player and, where appropriate, larger formats. Those who prioritise technical repetition, agility, and acceleration mechanics should compress space and reduce player

numbers (Faga et al., 2023; Ispyrlidis et al., 2024). Bout structure is another lever. Shorter, intermittent bouts raise internal load and enjoyment but may impair subsequent sprinting, so recovery and the sequencing of endurance and speed emphases within games warrant attention (Branquinho et al., 2021; Castillo et al., 2021; Farhani et al., 2022). Verbal encouragement and rule design, for their part, can lift engagement and skill output at minimal logistical cost (Hammami et al., 2023; Jumareng et al., 2024).

Relative to prior reviews, the present findings align with and refine earlier syntheses. Those earlier efforts combined SSGs with running-based conditioning and appraised technical, tactical behaviour; the current evidence extends them with recent randomised and maturation-sensitive work (Clemente & Sarmento, 2021; Ferreira-Ruiz & Martín-Tamayo, 2022; Zanin et al., 2021). Contradictions still surface, though. Studies disagree on whether SSGs fully replicate worst-case match demands, and they differ on the magnitude of format effects. The discrepancies plausibly trace to heterogeneous area-per-player reporting, differing playing levels, and inconsistent outcome definitions (Beato et al., 2023a; de Dios-Álvarez et al., 2024). That divergence makes the case for standardised methodology before any firm dose, response thresholds are set.

At least three gaps follow from this synthesis. Longitudinal and periodised designs remain scarce relative to acute studies, so knowledge of chronic adaptation and detraining remains limited (Daryanoosh et al., 2023; Wang et al., 2024). Female, masters, and lower-level populations are markedly under-represented, which constrains generalisability beyond male youth and professional cohorts (Chatzicharistou et al., 2025). Technical and tactical outcomes, meanwhile, are measured inconsistently and often coarsely, leaving the skill-acquisition value of specific constraints underspecified (Ferreira-Ruiz & Martín-Tamayo, 2022). This review has its own limitations. Reliance on a single database (Scopus) may have omitted relevant records, and the restriction to English-language articles from 2021, 2025 bounds the evidence temporally and linguistically. Heterogeneous outcomes also precluded meta-analytic pooling, so the synthesis remained narrative.

Three concrete directions follow. Multi-site randomised trials should standardise area-per-player and outcome reporting, enabling pooled dose, response modelling across formats and populations (Riboli et al., 2022). Research should deliberately recruit female and non-elite cohorts, with maturation and sex incorporated as planned moderators (Cherni et al., 2025). Studies should integrate validated technical, tactical and decision-making metrics with load monitoring, so that skill and physiological outcomes are optimised together rather than in isolation (Arslan et al., 2021; Thapa et al., 2023). In summary, the evidence answers RQ1 by delineating pitch size, player number, bout structure, and rules as the principal design levers. It answers RQ2 by showing that these levers exert broad, predictable, but coupled effects on physical, physiological, and technical, tactical performance.

Conclusions

This systematic review synthesised recent evidence on how small-sided game constraints shape soccer performance. For RQ1, the picture is fairly consistent. The literature keeps manipulating four principal characteristics to target specific qualities: pitch size and area per player, player number and format, bout duration and set structure, and rules. RQ2 reveals a clear trade-off. Enlarging space amplifies locomotor and physiological demand; compressing space raises technical density and neuromuscular load. Crank the intensity up too high, though, and decision-making starts to suffer. That coupling between physical and technical-tactical outcomes is a key takeaway. As for RQ3, there is no universal best setup. The most effective configuration shifts with the training goal. The review's core contribution is an integrated, evidence-based mapping of constraints to outcomes, which supports precise prescription. Its limitations are also worth noting: it relied on a single database, English-only sourcing, and no meta-analysis. To establish firm dose-response guidance, we need standardised, longitudinal, and sex-balanced trials going forward.

Acknowledgments

The authors sincerely thank all researchers whose published studies formed the foundation of this systematic literature review. Their contributions have significantly advanced knowledge in this field.

References

Arslan, E., Kilit, B., Clemente, F. M., Soylu, Y., Sögüt, M., Badicu, G., Akca, F., Gokkaya, M., & Murawska-Ciałowicz, E. (2021). The effects of exercise order on the psychophysiological responses, physical and technical performances of young soccer players: Combined small-sided games and high-intensity interval training. Biology, 10(11), Article 1180. https://doi.org/10.3390/biology10111180

Beato, M., Vicens-Bordas, J., Peña, J., & Costin, A. (2023a). Training load comparison between small, medium, and large-sided games in professional football. Frontiers in Sports and Active Living, 5, Article 1165242. https://doi.org/10.3389/fspor.2023.1165242

Beato, M., de Keijzer, K. L., & Costin, A. J. (2023b). External and internal training load comparison between sided-game drills in professional soccer. Frontiers in Sports and Active Living, 5, Article 1150461. https://doi.org/10.3389/fspor.2023.1150461

Branquinho, L., Ferraz, R., Travassos, B., Marinho, D. A., & Marques, M. C. (2021). Effects of Different Recovery Times on Internal and External Load During Small-Sided Games in Soccer. Sports Health, 13(4), 324–331. https://doi.org/10.1177/1941738121995469

Castillo, D., Raya-González, J., Sarmento, H., Clemente, F. M., & Yanci, J. (2021). Effects of including endurance and speed sessions within small-sided soccer games periodization on physical fitness. Biology of Sport, 38(2), 291–299. https://doi.org/10.5114/BIOLSPORT.2021.99325

Castillo-Rodríguez, A., Durán-Salas Á., Giménez, J. V., Onetti-Onetti, W., & Suárez-Arrones, L. (2023). The Influence of Pitch Dimensions during Small-Sided Games to Reach Match Physical and Physiological Demands on the Youth Soccer Players. Sensors, 23(3), Article 1299. https://doi.org/10.3390/s23031299

Chatzicharistou, P., Semaltianou, E., Lola, A., Stavropoulou, G., & Trigonis, I. (2025). Small-sided games (ssg) internal and external load on different pitch sizes in young elite women football players. Journal of Human Sport and Exercise, 20(4), 1235–1245. https://doi.org/10.55860/wcs6js80

Cherni, B., Marzouki, H., Selmi, O., Chen, Y. -S., Bouassida, A., & Chamari, K. (2025). Physiological, technical, and time-motion responses according to small-sided game formats and pitch size variations in adolescent male soccer players: effects of biological maturity status. Biology of Sport, 42(3), 37–49. https://doi.org/10.5114/biolsport.2025.146788

Clemente, F. M., & Sarmento, H. (2021). Combining small-sided soccer games and running-based methods: A systematic review. Biology of Sport, 38(4), 617–627. https://doi.org/10.5114/biolsport.2021.102932

Clemente, F. M., Pillitteri, G., Vieira, L. H. P., Rabbani, A., Zmijewski, P., & Beato, M. (2024). Balancing the load: A narrative review with methodological implications of compensatory training strategies for non-starting soccer players. Biology of Sport, 41(4), 173–185. https://doi.org/10.5114/biolsport.2024.139071

Clemente, F. M., Praça, G. M., Aquino, R., Castillo, D., Raya-González, J., Rico-González, M., Afonso, J., Sarmento, H., Silva, A. F., Silva, R., & Ramirez-Campillo, R. (2023). Effects of pitch size on soccer players' physiological, physical, technical, and tactical responses during small-sided games: a meta-analytical comparison. Biology of Sport, 40(1), 111–147. https://doi.org/10.5114/biolsport.2023.110748

Clemente, F. M., Soylu, Y., Arslan, E., Kilit, B., Garrett, J., van den Hoek, D., Badicu, G., & Silva, A. F. (2022). Can high-intensity interval training and small-sided games be effective for improving physical fitness after detraining? A parallel study design in youth male soccer players. PeerJ, 10, Article e13514. https://doi.org/10.7717/peerj.13514

Coutinho, D., Gonçalves, B., Santos, S., Travassos, B., Folgado, H., & Sampaio, J. (2022). Exploring how limiting the number of ball touches during small-sided games affects youth football players' performance across different age groups. International Journal of Sports Science and Coaching, 17(3), 545–557. https://doi.org/10.1177/17479541211037001

Daryanoosh, F., Alishavandi, H., Nemati, J., Basereh, A., Jowhari, A., Asad-manesh, E., Oliveira, R., Brito, J. P., Prieto-González, P., García-Calvo, T., Khoramipour, K., & Nobari, H. (2023). Effect of interval and continuous small-sided games training on the bio-motor abilities of young soccer players: a comparative study. BMC Sports Science, Medicine and Rehabilitation, 15(1), Article 51. https://doi.org/10.1186/s13102-023-00664-w

de Dios-Álvarez, V., Castellano, J., Padrón-Cabo, A., & Rey, E. (2024). Do small-sided games prepare players for the worst-case scenarios of match play in elite young soccer players?. Biology of Sport, 41(1), 95–106. https://doi.org/10.5114/biolsport.2024.127389

Dello Iacono, A., Beato, M., & Unnithan, V. (2021). Comparative Effects of Game Profile-Based Training and Small-Sided Games on Physical Performance of Elite Young Soccer Players. Journal of Strength and Conditioning Research, 35(10), 2810–2817. https://doi.org/10.1519/JSC.0000000000003225

Faga, J., Bishop, C., & Maloney, S. J. (2023). Does size matter? Effects of small versus large pitch small-sided game training on speed and endurance in collegiate soccer players. International Journal of Sports Science and Coaching, 18(6), 2033–2043. https://doi.org/10.1177/17479541221126955

Farhani, Z., Ghouili, H., Dhahbi, W., Ammar, A., Ben Aissa, M., Bouzouraa, M. M., Trabelsi, K., Guelmami, N., Souissi, N., Dergaa, I., Bouassida, A., & Ben Ezzeddine, L. (2025). Optimizing the number of players and training bout durations in soccer small-sided games: Effects on mood balance and technical performance. European Journal of Sport Science, 25(3), Article e12208. https://doi.org/10.1002/ejsc.12208

Farhani, Z., Hammami, R., Gene-Morales, J., Chortane, S. G., Bouassida, A., Juesas, A., & Colado, J. C. (2022). Bout duration and number of players of soccer small-sided games affect perceived enjoyment,

physiological responses, and technical-tactical performance. Science and Medicine in Football, 6(4), 503–510. https://doi.org/10.1080/24733938.2021.2009123

Ferreira-Ruiz Á., García-Banderas, F., & Martín-Tamayo, I. (2022). Systematic Review: Technical-Tactical Behaviour in Small-Sided Games in Men's Football. Apunts. Educacion Fisica y Deportes(148), 42–61. https://doi.org/10.5672/apunts.2014-0983.es.(2022/2).148.06

García-Calvo, T., Pulido, J. J., Ponce-Bordón, J. C., López-Gajardo, M. Á., Costa, I. T., & Díaz-García, J. (2021). Can rules in technical-tactical decisions influence on physical and mental load during soccer training? A pilot study. International Journal of Environmental Research and Public Health, 18(8), Article 4313. https://doi.org/10.3390/ijerph18084313

Guard, A. N., McMillan, K., & MacFarlane, N. G. (2022). The influence of relative playing area and player numerical imbalance on physical and perceptual demands in soccer small-sided game formats. Science and Medicine in Football, 6(2), 221–227. https://doi.org/10.1080/24733938.2021.1939408

Hammami, M. A., Guerchi, M., Selmi, O., Sehli, F., Ghouili, H., Stângaciu, O. A., Marinău, M. A., Galeru, O., & Alexe, D. I. (2023). Effect of Verbal Encouragement on Physical Fitness, Technical Skill and Physiological Response during Small-Sided Soccer Games. Sustainability (Switzerland), 15(4), Article 3624. https://doi.org/10.3390/su15043624

Hidalgo-De Mora, J., Cornejo-Daza, P. J., Sánchez-Valdepeñas, J., Rodiles-Guerrero, L., Riscart-López, J., Campos-Vázquez, M. Á., & Pareja-Blanco, F. (2025). Effects of pitch size and set configuration on mechanical responses and fatigue induced by different small-sided games in soccer. Retos, 63, 377–386. https://doi.org/10.47197/retos.v63.109184

Hong, Q. N., Pluye, P., Fàbregues, S., Bartlett, G., Boardman, F., Cargo, M., Dagenais, P., Gagnon, M.-P., Griffiths, F., Nicolau, B., O'Cathain, A., Rousseau, M.-C., & Vedel, I. (2018). Mixed Methods Appraisal Tool (MMAT), version 2018. Registration of Copyright (#1148552), Canadian Intellectual Property Office.

Ispyrlidis, I., Gourgoulis, V., Mitrotasios, M., & Mantzouranis, N. (2024). Physical performance and technical-tactical aspects in 4 vs. 4 small-sided games across various field formats among professional soccer players. Journal of Physical Education and Sport, 24(2), 482–487. https://doi.org/10.7752/jpes.2024.02059

Jastrzębski, Z., Wakuluk-Lewandowska, D., Arslan, E., Kilit, B., Soylu, Y., & Radzimiński Ł. (2025). Effects of Eight-Week Game-Based High-Intensity Interval Training Performed on Different Pitch Dimensions on the Level of Physical Capacity and Time-Motion Responses in Youth Soccer Players. Journal of Human Kinetics, 97, 157–168. https://doi.org/10.5114/jhk/190842

Jumareng, H., Setiawan, E., Tannoubi, A., Lardika, R. A., Adil, A., Gazali, N., Gani, R. A., Ahmedov, F., Kurtoğlu, A., & Alexe, D. I. (2024). Small Sided Games 3vs3 Goalkeeper-Encouragement: Improve the Physical and Technical Performance of Youth Soccer Players. European Journal of Human Movement, 52, 129–140. https://doi.org/10.21134/eurjhm.2024.52.11

Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gøtzsche, P. C., Ioannidis, J. P. A., Clarke, M., Devereaux, P. J., Kleijnen, J., & Moher, D. (2009). The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions. PLoS Medicine, 6(7), e1000100. https://doi.org/10.1371/journal.pmed.1000100

Nayıroğlu, S., Yılmaz, A. K., Silva, A. F., Silva, R., Nobari, H., & Clemente, F. M. (2022). Effects of small-sided games and running-based high-intensity interval training on body composition and physical fitness in under-19 female soccer players. BMC Sports Science, Medicine and Rehabilitation, 14(1), Article 119. https://doi.org/10.1186/s13102-022-00516-z

Ouertatani, Z., Selmi, O., Marsigliante, S., Aydi, B., Hammami, N., & Muscella, A. (2022). Comparison of the Physical, Physiological, and Psychological Responses of the High-Intensity Interval (HIIT) and Small-Sided Games (SSG) Training Programs in Young Elite Soccer Players. International Journal of Environmental Research and Public Health, 19(21), Article 13807. https://doi.org/10.3390/ijerph192113807

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., … Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. BMJ, 372, n71. https://doi.org/10.1136/bmj.n71

Qiao, W., Hua, K., Zhang, J., Song, D., Li, J., Chen, X., & Liang, D. (2025). Higher Heart Rate Intensity Can Negatively Impact Tactical Decision-Making and Technical Accuracy in Small-Sided Games: A Study on The Effects of Field Size and Scoring Method Manipulation. Journal of Sports Science and Medicine, 24(3), 522–531. https://doi.org/10.52082/jssm.2025.522

Riboli, A., Esposito, F., & Coratella, G. (2023). Technical and locomotor demands in elite soccer: manipulating area per player during small-sided games to replicate official match demands. Biology of Sport, 40(3), 639–647. https://doi.org/10.5114/biolsport.2023.118338

Riboli, A., Olthof, S. B. H., Esposito, F., & Coratella, G. (2022). Training elite youth soccer players: Area per player in small-sided games to replicate the match demands. Biology of Sport, 39(3), 579–598. https://doi.org/10.5114/biolsport.2022.106388

Santos, F. J., Figueiredo, T., Ferreira, C., & Espada, M. (2021). Physiological and physical effect on U-12 and U-15 football players, with the manipulation of task constraints: Field size and goalkeeper in small-sided games of 4x4 players. RICYDE: Revista Internacional de Ciencias del Deporte, 17(63), 13–24. https://doi.org/10.5232/RICYDE2021.06302

Segundo, J. F. S. N., Vieira, J. P., Ventura, A. P., Wan-Zuit, J. V., Pereira, G. S., Sanches, P. H. C., Teixeira, A. S., & da Silva, J. F. (2021). Tactical rule and pitch size change the physical and technical performance of young soccer players during small-sided games. Revista Brasileira de Cineantropometria e Desempenho Humano, 23, Article e70479. https://doi.org/10.1590/1980-0037.2021v23e70479

Soylu, Y., Ramazanoglu, F., Arslan, E., & Clemente, F. M. (2022). Effects of mental fatigue on the psychophysiological responses, kinematic profiles, and technical performance in different small-sided soccer games. Biology of Sport, 39(4), 965–972. https://doi.org/10.5114/biolsport.2022.110746

Thapa, R. K., Clemente, F. M., Moran, J., Garcia-Pinillos, F., Scanlan, A. T., & Ramirez-Campillo, R. (2023). Warm-up optimization in amateur male soccer players: A comparison of small-sided games and traditional warm-up routines on physical fitness qualities. Biology of Sport, 40(1), 321–329. https://doi.org/10.5114/biolsport.2023.114286

Thomas, J., & Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews. BMC Medical Research Methodology, 8, 45. https://doi.org/10.1186/1471-2288-8-45

Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. British Journal of Management, 14(3), 207–222. https://doi.org/10.1111/1467-8551.00375

Wang, L., Kang, Y., Wei, L., Li, M., & Wang, T. (2024). Can The Pitch Dimension Influence the Physical Fitness Adaptations Induced by Small-Sided Training Programs Added to Regular In-Field Training? A Randomized Controlled Study in Youth Soccer Players. Journal of Sports Science and Medicine, 23(2), 487–494. https://doi.org/10.52082/jssm.2024.487

Younesi, S., Rabbani, A., Clemente, F. M., Sarmento, H., & Figueiredo, A. J. (2021). Session-to-session variations in external load measures during small-sided games in professional soccer players. Biology of Sport, 38(2), 185–193. https://doi.org/10.5114/BIOLSPORT.2020.98449

Zaharia, G., Badau, D., Tudor, V., Costache, R., Geambasu, A., Damian, M., Giurgiu, L., Damian, C., Ursu, V. E., Rusu, R. G., Hasmasan, I. T., Stoian, I., & Tifrea, C. (2023). The Effects of 8 Aerobic Endurance Training Weeks of 4vs.4+GK Small-Sided Games versus Traditional Training on Physical Fitness and Skills among U18 Football Players. Applied Sciences (Switzerland), 13(13), Article 7963. https://doi.org/10.3390/app13137963

Zanin, M., Ranaweera, J., Darrall-Jones, J., Weaving, D., Till, K., & Roe, G. (2021). A systematic review of small sided games within rugby: Acute and chronic effects of constraints manipulation. Journal of Sports Sciences, 39(14), 1633–1660. https://doi.org/10.1080/02640414.2021.1891723