Integrated training through small-sided games: effects on football players' tactical engagement. A systematic review

Entrenamiento integrado a través de juegos reducidos: efectos sobre el compromiso táctico de los futbolistas. Una revisión sistemática

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Abstract

Background: Small-Sided Games (SSG) are commonly adopted in football as an integrated training approach that promotes concurrent improvements across players' physical, technical, and tactical domains. although numerous studies have examined their role in performance, the effects of specific task constraints on tactical engagement remain only partially clarified.
Objective: This systematic review sought to determine how various SSG-related constraints—including game format, pitch dimensions, age category, rule modifications, and coaching instructions—affect football players' tactical engagement.
Methods: Following PRISMA guidelines, an extensive search was conducted in Web of Science, PubMed, and Scopus databases. From 305 retrieved records, 36 studies satisfied all inclusion criteria and were analyzed in detail.
Results: Overall, the results show that smaller formats tend to stimulate individual tactical actions, while larger formats promote coordinated collective behaviors. changes in pitch size influence how players explore space and vary their tactical responses. task modifications, such as scoring rules or visual cues, affect offensive width and defensive compactness. age and experience also play a role, with more experienced players demonstrating more stable tactical patterns.
Discussion: In comparison with previous literature, these results align with earlier evidence highlighting the sensitivity of tactical behavior to constraint manipulation, while extending current knowledge by emphasizing the combined and interacting effects of multiple task variables. Conclusion: Overall, this review suggests that SSG are an effective training tool for guiding tactical engagement, while emphasizing the need for more robust and longitudinal research designs.

Keywords

Football; Integrated training; small-sided games; tactical engagement; task constraints.

Resumen

Antecedentes: Los juegos reducidos (SSGs) se emplean habitualmente en el fútbol como un enfoque de entrenamiento integrado que favorece mejoras simultáneas en los dominios físico, técnico y táctico de los jugadores. Aunque numerosos estudios han examinado su papel en el rendimiento, los efectos de las restricciones específicas de la tarea sobre el compromiso táctico permanecen solo parcialmente esclarecidos.
Objetivo: Esta revisión sistemática tuvo como objetivo determinar cómo diferentes restricciones asociadas a los SSGs —incluidos el formato de juego, las dimensiones del campo, la categoría de edad, las modificaciones de las reglas y las instrucciones del entrenador— influyen en el compromiso táctico de los futbolistas.
Métodos: Siguiendo las directrices PRISMA, se realizó una búsqueda exhaustiva en las bases de datos Web of Science, PubMed y Scopus. De los 305 registros identificados, 36 estudios cumplieron todos los criterios de inclusión y fueron analizados en detalle.
Resultados: En general, los resultados muestran que los formatos más reducidos tienden a estimular acciones tácticas individuales, mientras que los formatos más amplios promueven comportamientos colectivos coordinados. Los cambios en el tamaño del campo influyen en la forma en que los jugadores exploran el espacio y adaptan sus respuestas tácticas. Las modificaciones de la tarea, como las reglas de puntuación o los estímulos visuales, afectan la amplitud ofensiva y la compacidad defensiva. La edad y la experiencia también desempeñan un papel, ya que los jugadores más experimentados presentan patrones tácticos más estables.
Discusión: En comparación con la literatura previa, estos resultados coinciden con evidencias anteriores que destacan la sensibilidad del comportamiento táctico a la manipulación de las restricciones, a la vez que amplían el conocimiento actual al resaltar los efectos combinados e interactivos de múltiples variables de la tarea.
Conclusión: En conjunto, esta revisión sugiere que los SSGs constituyen una herramienta de entrenamiento eficaz para orientar el compromiso táctico, al tiempo que subraya la necesidad de diseños de investigación más sólidos y longitudinales.

Palabras clave

Compromiso táctico; entrenamiento integrado; fútbol; juegos reducidos; restricciones de la tarea.

Introduction

Football is a complex team sport involving physiological, technical, and tactical dimensions that shape both training and competition (Aguiar et al., 2012). Continuous interactions between teammates and opponents create dynamic, unpredictable game contexts, requiring training environments that closely mirror competitive demands (Parlebas, 2020). In response to this complexity, integrated training approaches have gained prominence by simultaneously engaging multiple performance dimensions within ecologically valid tasks (Travassos et al., 2014).

Within integrated training, Small-Sided Games (SSGs) are among the most widely used methods in football practice (Clemente, Afonso, et al., 2020). SSGs consist of modified game formats played with fewer players and adapted pitch dimensions, allowing coaches to emphasize specific tactical and technical objectives while preserving key informational constraints of the formal game.

Although extensively applied, SSG design does not always align with intended training goals. Modifications in game format, pitch configuration, rules, or work–rest structure—commonly referred to as task constraints—directly shape emergent player behaviors and technical–tactical responses (Clemente, 2014; Praça, Costa, et al., 2016). Consequently, careful manipulation of these constraints is essential to ensure that SSGs effectively target the desired training outcomes (Coutinho et al., 2019b; Machado, Ribeiro, et al., 2019b; Moreira et al., 2020).

Earlier investigations into SSGs primarily focused on physiological and physical outcomes, highlighting their ability to induce both internal and external overload in players (Hill-Haas et al., 2011; Sarmento, Clemente, Harper, et al., 2018; Chootsungnoen et al., 2025). Several systematic reviews have further consolidated these results (Aguiar et al., 2012; Bujalance-Moreno et al., 2019; Halouani et al., 2014; Hill-Haas et al., 2011; Muhyi et al., 2025). More recently, however, attention has shifted towards their potential to foster technical and tactical behaviors (Clemente, Afonso, et al., 2020; Ometto et al., 2018; Sarmento, Clemente, Harper, et al., 2018). Indeed, SSGs provide a framework for exposing players to specific tactical problems and stimulating their adaptive capacities (Clemente, Chen, et al., 2018; Martone et al., 2017; Serra-Olivares et al., 2015).

Nevertheless, despite a growing body of research, an imbalance persists: most studies continue to focus on physiological loads, whereas the technical-tactical dimensions, particularly tactical engagement, remain underexplored (Francesco Sgrò et al., 2018; Ometto et al., 2018). Tactical engagement refers to players' active involvement in collective tactical principles and shared decision-making during play. In this review, it is distinguished from isolated tactical behaviors, individual actions, or outcome-based tactical performance, as it emphasizes collective coordination and interaction dynamics. Tactical engagement can be analyzed through observational methods or positional data, based on spatio-temporal relationships within and between teams (Clemente, Sequeiros, et al., 2018; Memmert et al., 2017), allowing the assessment of how SSG design influences team organization and coordination.

Thus, although SSGs represent an effective method for introducing and shaping tactical problems, their precise role in fostering tactical engagement in football remains unclear. The present systematic review aims to compile and analyze existing literature to determine how integrated training through small-sided games influences players' tactical engagement, and to provide coaches with practical guidelines for designing tasks that meet technical-tactical objectives.

Method

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, which provide methodological standards for the planning, searching, and reporting of systematic reviews (Moher et al., 2010).

Study eligibility and inclusion criteria

The eligibility criteria for this systematic review were established using the PICO framework (Population, Intervention, Comparator, Outcomes). The population consisted of football players of all ages, gen-

ders, and competitive levels. The intervention focused on the use of small-sided games (SSGs) as an integrated training approach. The comparisons included different SSG configurations. The outcomes concerned tactical indicators such as collective occupation of space, defensive organization, or transition management. Based on this framework, the inclusion criteria were: (a) articles written in English; (b) studies exclusively focused on football; (c) complete, peer-reviewed, and full-text articles; (d) studies conducted in a competitive context; (e) interventions including training through SSGs; (f) outcomes reported on tactical behavior. The exclusion criteria were: (a) studies conducted in educational rather than competitive contexts; (b) articles not available in English; (c) studies not addressing tactical behavior in football; (d) studies analyzing only physical performance; (e) articles lacking a scientific framework (e.g., descriptive reports, opinion papers); (f) studies not presenting empirical findings; and (g) other meta-analyses or systematic reviews.

Search strategy

The literature search was carried out across the Scopus and Web of Science databases, covering studies published between 2015 and 2025. This time frame was selected to capture contemporary research reflecting current analytical techniques, methodological approaches, and training frameworks in small-sided game (SSG) research. To ensure completeness, an additional search was also conducted in PubMed, and the reference lists of all selected articles were examined to identify any other potentially relevant studies. Search queries were built by combining keywords and Boolean operators adapted to each database, using the following string:

("small-sided games" OR "SSG") AND ("soccer" OR "football") AND ("integrated physical preparation" OR "integrated training") AND ("tactical engagement" OR "tactical behavior" OR "decision-making" OR "tactical decision" OR "tactical performance").

All retrieved citations were exported into Zotero reference manager, which was used to organize the results and automatically eliminate duplicates. The study selection procedure adhered to the PRISMA guidelines. After duplicate removal, two reviewers independently screened the titles and abstracts to exclude irrelevant records. Articles that appeared to meet the inclusion criteria were then examined in full text for confirmation. Any disagreements between reviewers were discussed until a consensus was achieved.

The complete selection process is illustrated in Figure 1 (PRISMA flow diagram), which outlines the total number of records identified, excluded, and finally retained for analysis.

Methodological quality

The methodological quality and risk of bias of the included studies were examined using a 16-item checklist specifically developed and validated for research involving Small-Sided Games (SSGs) (Sarmento, Anguera, et al., 2018; Sarmento, Clemente, Araújo, et al., 2018). This tool assesses several aspects of methodological rigor and reporting quality. According to (Sarmento, Anguera, et al., 2018), the checklist evaluates: (1) clarity of the study's purpose; (2) adequacy and relevance of the background literature; (3) suitability of the research design; (4–5) description and justification of the sample; (6) ethical considerations and informed consent procedures; (7–8) definition and validity of outcome measures; (9) detail of methodological procedures; (10) statistical significance of findings; (11) appropriateness of data analysis; (12) practical relevance of the results; (13) reporting of participant drop-outs; (14) coherence between data and conclusions; (15) practical applications derived from findings; and (16) acknowledgment of study limitations.

Each criterion in the checklist was rated using a binary scoring system (0 = not respected; 1 = respected). For items referring to informed consent and participant drop-outs, a third option — "not applicable" (NA) — was available when those elements were irrelevant to the study design.

The overall methodological quality score of each article was determined by dividing the number of fulfilled criteria by the total number of applicable items.

Following the classification system proposed by (Sarmento, Clemente, Araújo, et al., 2018), studies were categorized as: (1) low quality (≤ 50%), (2) good quality (51–75%), and (3) excellent quality (> 75%).

Data Extraction

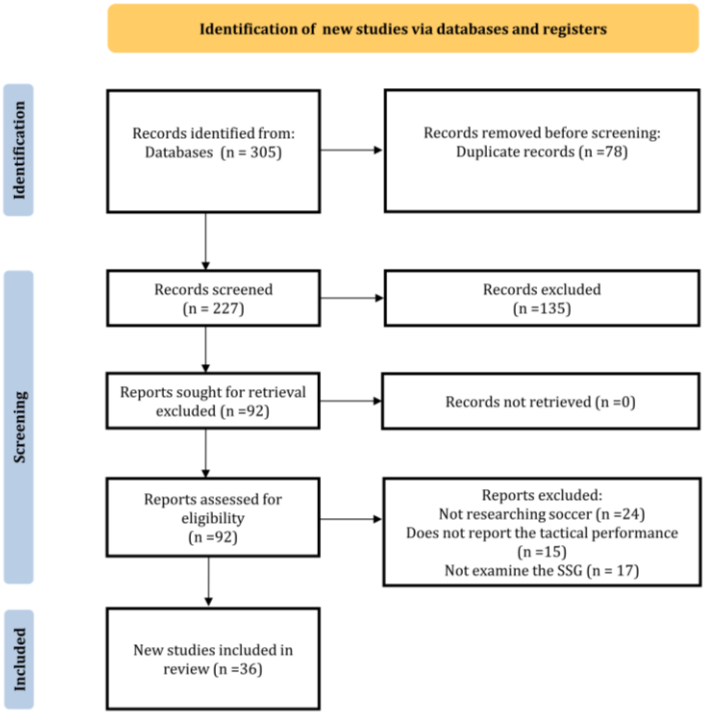
Data extraction was conducted using a standardized data collection sheet designed to maintain consistency across all selected studies. The extracted information included general study characteristics such as the author's name, year of publication, sample size, participants' age, and level of competition. Furthermore, specific details concerning the interventions and measured outcomes were systematically recorded. These included: author and year, study objective, SSG format, pitch dimensions (m), work, applied rules, analyzed variables, and main results.

Results

Study identification and selection

In total, 305 studies were initially retrieved through the database searches. All references were imported into Zotero, which automatically detected and removed 72 duplicate records. Following this step, the titles and abstracts of the remaining studies were screened, leading to the exclusion of 135 papers that did not meet the review's objectives. Subsequently, 56 full-text articles were also excluded after detailed evaluation for noncompliance with the inclusion criteria. Additionally, nine relevant papers were manually identified through PubMed searches based on thematic alignment. As a result, 36 studies met all inclusion and exclusion criteria. They were retained for the final synthesis, yielding a combined sample of 1,319 participants whose tactical behaviors were assessed across varying SSG formats. The overall screening and selection procedure is depicted in the PRISMA flow diagram (Figure 1), illustrating the number of records identified, excluded, and finally included in the review.

Figure 1. PRISMA Flowchart of the selected studies



Study Characteristics Included Review

In this systematic review, the effects of integrated training through Small-Sided Games (SSGs) on players' tactical engagement were examined primarily through the manipulation of game constraints. After a comprehensive and systematic analysis of the included studies, the main body of evidence was categorized into five thematic areas: (1) effects of different game formats, (2) effects of pitch dimension and configuration, (3) effects of task-related modifications, (4) effects related to age and competitive level, and (5) integrated effects combining multiple constraints.

The studies analyzing small-sided game formats reported variations in spatial and tactical behaviors depending on the number of players and the numerical relations. Larger formats were associated with broader spatial distributions and more regular positioning, whereas smaller formats showed greater variability and a higher prevalence of individual actions. The inclusion of floaters or numerical imbalances was associated with changes in adequate playing space and team spatial organization.

Studies focusing on pitch size and configuration have described differences in collective behavior linked to playing-area dimensions and geometry. Larger pitches were associated with increased spatial dispersion and variability, while denser interactions characterized smaller or more constrained spaces. Pitch orientation (elongated vs. wide) was also associated with distinct spatial distributions.

Research examining rule and task constraint modifications reported changes in team organization following adjustments to scoring systems, verbal instructions, and visual references. Differences were described in spatial occupation, movement regularity, and play sequence characteristics depending on the task objectives.

Studies addressing age and skill level consistently reported differences between player groups. Older or more experienced players showed more stable spatial patterns, whereas younger players exhibited greater variability. Competitive level was also associated with distinct responses to task constraints.

Finally, studies grouped under integrated effects reported alterations in collective coordination under fatigue and differences in spatial organization associated with tactical formations. At the same time, aerobic capacity showed limited associations with tactical variables.

Table 1. Effects of different games formats on tactical engagement

Author / year	Sample	Objective	SSGs format	Pitch size (m)	Work	Rules	Analyzed variables	Results
(Aguiar et al., 2015)	10 participants (aged 18years old)	Examine how changes in format affect tactical engagement	2v2+ Gk, 3v3+ Gk, 4v4+ Gk, 5v5+ Gk	28×21 35x26 40x30 44×34	3×6' /1'	No offside	Distances to team and opponent centroids; inter-centroid spacing	Larger formats increased distances to centroids and stabilized player positioning; smaller formats (2v2) caused more irregular and unpredictable positioning.
(Gonçalves et al., 2016)	22 participants (aged 25.6 years old) (amateur, pro)	Assess impact of format changes on tactical engagement	4v3+ Gk, 4v3+2+ Gk, 4v3+4+ Gk	40×30	1×3'	Standard	Distances to centroid and opponent; nearest-opponent distance; effective play space	Increasing player numbers expanded effective playing space and improved inter-team coordination.
(Ric et al., 2016)	8 participants (aged 26 years old pro)	Investigate effects of format changes on tactical engagement	4v3+ Gk, 4v5+ Gk, 4v7+ Gk	40×30	1×3'	Standard	Tactical actions, player interactions, zone occupation	In 4v3 situations, tactical actions tended to concentrate mainly in intermediate offensive areas, whereas in 4v7 scenarios, the predominant actions shifted toward the middle and deeper defensive zones. Facing a larger number of opponents also reduced variability in players' decisions and limited their individual adaptability.
(Torrents et al., 2016)	44 participants (22 amateur aged 23.1 years old) (22 pro aged 25.6 years old)	Examine format effects on tactical behavior	4v3+ Gk, 4v5+ Gk, 4v7+ Gk	40×30	1×3'	Standard rules; scoreboard reset after 2-goal difference	Defensive responses (pressing, delaying, balance…)	More opponents increased defensive actions (controlling) and decreased waiting; numerical disadvantage promoted flexibility and more fluid behavior; easier formats led to more regular, less variable play.
(Bach Padilha et al., 2017)	168 participants aged 16.6 years old	Assess how using floaters modifies tactical engagement	3v3+ Gk, 3v3+2+ Gk	36×27	1×5'	Floaters positioned on the sidelines	Tactical behaviors (FUT-SAT), ball possession, goal attempts, fouls, corners, throw-ins	Absence of floaters increased duels and use of penetration/concentration principles; presence of floaters improved space utilization and ball possession.
(Greco & Moreira	18 participants	Examine floater	3v3, 3v3+2,	36×27	1 x 4'	No Gk; Standard;	Social network metrics:	4v3 showed higher total links, density, clustering; 3v3

Praça, 2017)	aged 16.4 years old	influence on tactical engagement	4v3			small goals;	(connections, overall network cohesion…)	had higher centrality, prestige, page rank.
(Canton et al., 2019)	30 participants aged 19.9 years old (N=15) 13.8 years old (N=15)	Examine temporary numerical variations and their impact on tactical engagement	4v4+ Gk, 5v4+ Gk, 4v5+ Gk, 6v4+ Gk, 4v6+ Gk	45×40	1×5’	One balanced game (4v4); others changed format each minute; offside not applied	Sector use, corridor entry, centroid speed, team width/length	Younger players explored more in short-term, older players in long-term; numerical imbalances influenced exploratory behaviors.
(Olthof et al., 2019)	280 participants aged 12.7 years old	Study combined effects of format and pitch size on tactical engagement	4v4+GK, 6v6+GK, 8v8+GK	68×47 80x56 91×63	3–5 repetitions of 4–10’	Standard	Team dispersion, interpersonal distance, field occupation	Larger formats increased team tactical measures and reduced variability.
(Praça, Folgado, et al., 2016)	18 elite male players, aged 16.4 yo	Compare tactical behavior in balanced vs. unbalanced SSGs	GK+3v3+GK, GK+4v3+GK	36×27	2×4’	Standard	Penetration, offensive/defensive unity, balance	4v3: larger effective space and ball circulation; 3v3+2: promoted longitudinal play and faster progression. Distinct tactical behaviors emerged per configuration.
(García-Angulo et al., 2020)	40 participants aged 11.7 years old	Effect of reducing players, goal size, and pitch on tactical behavior	GK+7v7+GK, GK+4v4+GK	58×38 38x30 38×20	2×20’ / 10’	Not mentioned	Technical-tactical actions via observation	Modified rules led to more diverse actions, increased team play, better alignment with U-12 development, and greater game continuity.

Table 2. Effects of configuration and pitch size on tactical engagement

Author / year	Sample	Objective	SSGs format	Pitch size (m)	Work	Rules	Analyzed variables	Results
(Silva et al., 2015)	24 participants aged 14.5 years old	To examine how different relative playing areas per player affect tactical engagement	6v6, 7v7, 8v8, 9v9	From 46.7×30.3 (118 m^2) to 57.3×37.1 (152 m^2)	1×6’	Scoring through central corridor; no GK	Free-movement radius, relative area, spatial variability, numerical relations	Larger playing areas increased the amount of functional space available to each player, and introducing additional players promoted broader use of the pitch and more exploratory movement patterns. Situations of numerical inferiority generally remained stable throughout play.
(Silva et al., 2016)	10 participants aged 13.6 years old	Investigate influence of individual space on tactical engagement	3v3, 4v4, 5v5	36×28 (101–168 m^2)	1×5’	Two small goals per side; no goalkeepers; no offside	Team dispersion, separateness, team delay, coupling dynamics	Reduced individual space increased player dispersion, but no significant changes were observed in team separateness or coupling strength.
(Gonçalves et al., 2017)	19 participant aged 25.1 years old (pro)	Assess tactical impact of spacing conditions that are limited, adjacent, or unconstrained on tactical engagement	10v9+Gk	64×58.5 (197 m^2)	6 x 5’ / 3’ rest	Scoring differed between teams: 9-player team aimed at goal; 10-player team targeted specific zones	Distance between players, coordination timing, and measures of spatial exploration.	Pitch restrictions reduced measures of spatial exploration. No major differences were found in inter-player distances, but restricted-spacing led to lower variability and increased longitudinal synchronization.
(Olthof et al., 2018)	148 participants, aged 12.5 years old	To explore the impact of pitch size on tactical engagement	4v4+Gk	40x30 (120 m^2) and 68x47 (320 m^2)	1×4’	No offside on smaller pitch	Stretch index, L/W, Inter-team distance, ratio defender spacing – Gk, area	Larger pitches promoted longer ball possession phases and fewer transitions, as well as greater variability in intra-team distances.
(Coutinho, Gonçalves, Santos, et al., 2019a)	40 participants, aged 11.3 years old (N=20), 13.3 years old (N=20)	To analyze how pitch configuration affects tactical engagement	5v5+Gk	36×25 (90 m^2)	1×6’	Regular, lateral, rotated, dynamic layouts	Effective playing space, dyadic distances, longitudinal/lateral synchronization	Greater team dispersion and dyadic distances were found in regular and differently oriented configurations.
(Folgado et al., 2019)	20 participants aged 14.1 years old	To assess the effect of altering pitch shape (length vs. width	4v4+Gk	40×30 and 30×40 (150 m^2 each)	3 x 6’ / 3’ rest	No offside	Length/width, centroid distances, GK–defender spacing	40×30 pitch improves team length and centroid distance, whereas 30×40 m format increased team width.

		emphasis) on tactical behavior						
(Jara et al., 2019)	3 goalkeepers, 24.5 years old	Study influence of pitch sizes on GK tactical engagement	5v5+Gk	32×23 (74 m^2), 50×35 (175 m^2), 62×44 (273 m^2)	3×8' / 5' rest	No corners; unlimited ball supply	measure of spatial exploration and the area covered by standard or predictive ellipses.	Smaller pitches reduced spatial exploration and ellipse areas, indicating more constrained movement patterns.

Table 3. Effects of various task-related modifications on tactical engagement

Author / year	Sample	Objective	SSGs format	Pitch size (m)	Work	Rules	Analyzed variables	Results
(Castellano et al., 2016)	24 male players (19.1 ± 1.2 yrs)	To compare how distinct scoring conditions (small goals, gk, floaters) affect tactical organization	7 v 7 + Gk 7 v 7 7 v 7 + Gk + 2 neutral players	40 x 25	1 × 6′	Small goals used in formats without GK; no offside rule	Team length/width, ball possession %, offensive sequence duration, team shape, team separateness	The GK formats produced wider and longer team structures during attack. Teams were more stretched with GK, whereas closer inter-player distances occurred without GK.
(Bastia et al., 2019)	16 semi-professional players (23.9 ± 5.4 yrs)	To examine the tactical impact of coach instructions during play	7 v 7 + GK	62 × 50	1 × 5′	Sessions with: no instruction, defensive instruction, or offensive instruction; standard rules applied	Team length/width, ball recoveries, passes per possession, effective playing area,	Defensive guidance increased ball recovery frequency and reduced spatial dispersion; offensive cues produced more passes and greater team expansion relative to control.
(Coutinho et al., 2020)	10 youth players (13.7 ± 0.5 yrs)	To determine how different external pitch markings influence collective behavior	5 v 5 + GK	30 × 25	3 × 6′ / 3′ rest	Three marking types: full lines, dashed lines, corner markers	Dyadic distances, effective space, longitudinal/lateral synchronization	Continuous line markings enhanced synchronization and technical involvement but reduced overall effective playing area and number of passes.
(Coutinho, Gonçalves, Travassos, et al., 2019b)	12 participants aged 15.9 yrs)	To evaluate the effect of spatial references dividing the field into corridors/sectors on coordination patterns	6 v 6 + GK	62 × 43	3 × 6′ / 3′ rest	Conditions: no markings (control) vs. spatial segmentation	Stretch index, dyadic distances, occupied zones, synchronization	Spatial segmentation increased positional regularity and inter-player variability, but slightly decreased team synchronization levels.
(Machado, Ribeiro, et al., 2019b)	20 youth players: 13.5 ± 1.2 yrs (n = 10) and 16.3 yrs (n = 10)	To analyze the influence of rule and configuration variations on tactical behaviors	3 v 3 + Gk 4 v 4 + Gk	36 x 27 ; 47.7 x 29.5	1 × 10′	Three possession-based and 3 progression-to-target SSGs	Ball recovery/start, transition, possession progress, offensive phase end, spatial distribution, team interaction patterns, passes, touches, shots	Smaller formats challenged younger players' ball retention. 4 v 4 promoted better tactical organization in possession; 3 v 3 favored attacking effectiveness in progression tasks. Longer passing chains occurred under possession-maintenance conditions.
(Serra-Olivares et al., 2015)	21 non-elite participants (≈ 10 yrs)	To compare two game-based teaching approaches—representation and exaggeration—on game performance	3 v 3	32 × 22 and 29.5 × 15	8′	Standard rules	Decision-making, skill execution, tactical adaptation	No significant difference between conditions in decision or execution skills (p > .7/.2); "watcher-player" behavior higher under representation + exaggeration; both formats promoted adaptable learning.
(Machado et al., 2016)	14 young players (13.8 ± 1.9 yrs)	To investigate rule manipulation effects on offensive organization	6 v 6 + GK	52 × 32	30′	Not specified	Ball possession duration, players involved, passes per touch/player, ratio indices	Rule changes notably modified offensive patterns; possession-oriented tasks encouraged retention, while progression tasks elicited forward, goal-driven play.
(Gonet et al., 2020)	20 participants aged 21.2 yrs; 13. yrs experience	To examine how varying the number of goals in SSG formats influences players'	5 v 5	20 × 25	2 × (3 × 4′ / 2′ rest)	Standard rules	RPE, TSAP, BTS indices	Similar perceived effort across formats; single-goal games yielded more ball recoveries, higher efficiency and performance indices. Goal-number manipulation allows

		technical-tactical actions and their perceived level of effort.						adaptation of task demands to objectives.

Table 4. Effects of age and competitive level on tactical engagement

Author / year	Sample	Objective	SSGs format	Pitch size (m)	Work	Rules	Analyzed variables	Results
(Olthof et al., 2015)	39 participants (15.4 yrs, n = 23; 17.4 yrs, n = 16)	To examine age-related differences in collective tactical behavior	4 v 4 + GK	40 × 30	6 × 6′ / 1.5′ rest	No offside	Stretch index, Inter- L/W ratio, Team distance,	Older players displayed greater longitudinal spacing and higher lateral stretch indices, while their length-to-width ratios were lower, suggesting more compact yet wider structures.
(Barnabé et al., 2016)	36 participants (15.2 ± 0.4 yrs; 16.3 ± 0.5 yrs; 17.4 ± 0.5 yrs; n = 12 per group)	To explore how age influences spatial occupation and coordination	6 v 6 + GK	60 × 33	1 × 8′	No offside; goalkeepers limited to two touches	Stretch index, Team width/length, Surface area,	Older participants demonstrated greater pitch dispersion and spatial stability during attacks, indicating more coordinated and balanced tactical organization.
(Machado, Barreira, et al., 2019a)	48 participants (13.1 ± 1.5 yrs, n = 24 ; 16.9 ± 0.1 yrs, n = 24)	To assess the combined effects of age and expertise on individual and collective actions	3 v 3 + Gk 4 v 4 + Gk	47.7 × 29.5	1 × 10′	Offside rule omitted	Phases of play (recovery, transition, development, finalization), ball possession, touches, passes, shots	Players with higher tactical proficiency showed greater offensive fluidity, effectiveness, and exploratory play behaviors compared with less experienced peers.
(Reis & Almeida, 2020)	78 players divided by maturation level (13.2 ± 1.1 yrs, n = 45; 15.0 ± 0.8 yrs, n = 23; 15.7 ± 0.8 yrs, n = 10)	To compare tactical performance across different maturational stages	GK + 6 v 3 + GK	36 × 27	1 × 4′	Standard	Somatic maturation (distance from PHV); tactical behavior via FUT-SAT	No global performance differences were found between groups (p = .75). However, post-PHV players executed penetrations more efficiently (p = .01), while pre-PHV players displayed higher tactical variability.
(Nunes et al., 2020)	20 male participants (22.3 yrs; 12.1 yrs experience)	To evaluate how varying player numbers affect internal load, external demands, and tactical actions	4 v 6 4 v 5 4 v 4 4 v 3 4 v 2	30 × 25	4 × 4′ / 4′ rest	Standard	External load (GPS, ZEPP system), internal load (Borg scale), tactical indicators	Numerical imbalance modulated internal and external loads but not overall tactical efficiency. Reduced-player scenarios led to greater tactical adaptability and variability.
(Moreira et al., 2020)	36 youth players (13.1 ± 0.6 yrs, n = 18; 14.3 ± 0.7 yrs, n = 18)	To analyze the effect of total and relative playing area on tactical behavior	3 v 3; 3 v 3 + 1 (two pitch sizes)	36 × 27 ; 40 × 29	4 × 4′ / 4′ rest	Standard	Game principles (FUT-SAT); team interactions (Social Network Analysis)	U14 players performed more offensive coverage (p = .01) with lower eigenvector dispersion. Enlarging relative area increased offensive coverage, while smaller spaces enhanced offensive unity and player interconnection.
(Clemente, Castillo, et al., 2020)	48 players (U13 = 13.9 ± 0.3 yrs; U15 = 15.7 ± 0.5 yrs; U18 = 18.4 ± 0.8 yrs; n = 16 per group)	To compare team spatial dynamics across age categories in small-sided formats	GK + 4 v 4 + GK	30 × 20	3 × (4 × 4′ / 3′ rest)	Standard	Spatial metrics (GPS WIMU PRO)	Older groups covered larger effective areas (p < .001), with greater centroid distances and higher stretch indices, reflecting more dispersed and coordinated spatial organization.

Table 5. Integrated effects on tactical engagement

Author / year	Sample	Objective	SSGs format	Pitch size (m)	Work	Rules	Analyzed variables	Results
(Coutinho et al., 2017)	12 youth participants aged 15.9 yrs)	To evaluate how mental fatigue influences collective tactical behavior	6 v 6 + GK	62 × 43	3 x 6′ / 3′ rest	Not specified	Space occupation index, longitudinal and lateral player synchronization, team length and width, collective spread, and contraction/expansion speed.	Players under mental fatigue demonstrated reduced dyadic synchronization compared with control conditions, suggesting impaired tactical coordination.

(Gonzalez-Rodenas et al., 2024)	18 players aged 17.9 yrs	To explore how tactical formations affect collective organization	7 v 7 + GK	65 × 50	5 × 2′	Two formations: 2-3-1 vs 3-3 3-1-2 vs 3-3	Team length, height, width, stretch index, surface area	The 3-1-2 structure encouraged broader and more expansive team organization with greater width and height, while the 2-3-1 setup resulted in shorter team length and a more compact defensive arrangement.
(Coutinho et al., 2018)	10 youth players aged 13.7 yrs	To assess how mental and muscular fatigue affect tactical coordination	5 v 5 + GK	30 × 25	3 × 6′ / 3′ rest	Not specified	Dyadic distances, stretch index, longitudinal/lateral synchronization	Muscular fatigue disrupted inter-player regularity and increased synchronized longitudinal movement time, whereas both muscular and mental fatigue reduced dyadic spacing relative to control conditions.
(Praça et al., 2019)	18 participants aged 16.4 yrs	To determine the impact of aerobic capacity differences on tactical organization	3 v 3 + GK	36 × 27	2 x 4′ / 4′ rest	Standard	Offensive and defensive actions (FUT-SAT), team network density, clustering metrics	Variations in aerobic capacity produced only trivial to small effects on tactical efficiency and network structure, indicating minimal influence on collective behavior.

Methodological Quality

Using the SSG research quality assessment questionnaire (Sarmento, Anguera, et al., 2018), only one study obtained a perfect score of 100%. No study scored below 75%, with the lowest score recorded at 75%. Among the 36 evaluated articles, 35 (97.2%) were classified as being of excellent quality. The main potential limitations observed across the included studies were the lack of explicit acknowledgment of study limitations and the absence of justification for sample size selection.

Discussion

The primary objective of this systematic review was to examine how integrated training through Small-Sided Games (SSGs) affects tactical engagement among football players. Unlike previous reviews, the present study focuses specifically on tactical engagement as an emergent collective construct, integrating multiple task constraints rather than treating them as isolated variables. The analysis revealed that all investigated SSG formats generated distinct variations in tactical behavior, reflected in the growing number of studies and the relatively large aggregated samples. Overall, these outcomes offer valuable insights for coaches, supporting the design, planning, and adaptation of SSGs according to players' specific developmental needs and targeted training goals.

The overall methodological quality of the included studies was high, with 97.23% rated as excellent, reinforcing the reliability of the present synthesis. However, it is possible that the evaluation checklist used—although validated—did not sufficiently penalize certain methodological aspects, such as the justification of sample size, a recurrent weakness identified in several studies.

To facilitate interpretation, the discussion is structured according to the thematic categories emerging from the reviewed studies.

Effects of Different Small-Sided Game Formats on Tactical Engagement

The evidence synthesized in this review confirms that Small-Sided Game (SSG) formats act as decisive constraints shaping collective tactical engagement rather than neutral training conditions. Across the included studies, increasing the number of players within SSGs consistently led to more organized collective structures, characterized by greater spatial dispersion, more stable inter-player distances, and clearer team organization patterns (Aguiar et al., 2015; Olthof et al., 2019; García-Angulo et al., 2020). These adaptations suggest that larger formats better support the emergence of coordinated spacing and positional balance, which are essential for reproducing match-related collective dynamics.

Conversely, smaller formats were repeatedly associated with higher positional variability and less predictable movement patterns (Aguiar et al., 2015; Ric et al., 2016). Rather than being a limitation, this instability may represent a functional stimulus for tactical learning, as it increases individual involvement in decision-making and problem-solving. Such formats appear particularly appropriate for targeting individual tactical engagement, especially in younger or less experienced players, where exploration and adaptability are key developmental objectives (García-Angulo et al., 2020; Canton et al., 2019).

Several studies further highlighted that numerical imbalance constitutes a powerful modifier of tactical engagement by reshaping collective priorities. Underloaded teams tended to adopt more compact defensive organizations, emphasizing collective protection and spatial control, while overloaded teams were encouraged to circulate the ball and exploit available space (Gonçalves et al., 2016; Praça, Folgado, et al., 2016; Ric et al., 2016; Torrents et al., 2016). These findings align with ecological perspectives, indicating that tactical engagement emerges as an adaptive response to altered informational constraints rather than as a fixed behavioral pattern. Importantly, age and experience moderated these effects, with more experienced players displaying greater tactical stability and coherence when facing numerical constraints (Canton et al., 2019).

The inclusion of support players (floaters) also emerged as a relevant methodological strategy. Studies showed that floaters facilitate offensive continuity, increase spatial occupation, and strengthen interaction networks without excessively increasing task complexity (Bach Padilha et al., 2017; Greco & Moreira Praça, 2017). This suggests that floaters can be effectively used to enhance collective tactical engagement while maintaining high levels of participation across players.

Taken together, these findings indicate that SSG format manipulation should be deliberately aligned with specific tactical learning objectives. Smaller formats appear more suitable for stimulating individual engagement and adaptive behaviors, whereas larger and numerically balanced formats favor collective organization and spatial stability. Rather than seeking an optimal format, coaches should strategically combine player numbers, numerical relations, and support roles to guide the emergence of targeted collective tactical behaviors.

Effects of Pitch Size and Configuration on Tactical Engagement

Variations in pitch size and configuration clearly shape how teams organize collectively and explore space during SSGs. Increasing the relative area per player generally enhances spatial exploration and team organizational variability, whereas higher player density tends to constrain these behaviors (Silva et al., 2015; Silva et al., 2016). Larger surfaces also encourage more elaborate ball circulation, longer possessions, and reduced transitional play, reflecting a more structured tactical organization (Olthof et al., 2018). In contrast, altering pitch shape—without changing total area—modulates the direction of collective dispersion, with elongated pitches facilitating vertical expansion and wider pitches promoting lateral spread (Folgado et al., 2019).

Specific spatial configurations further demonstrate that unrestricted or reoriented pitches increase dispersion and inter-player distances, supporting more efficient use of space, whereas restricted layouts reduce exploratory behavior and impose more rigid movement patterns (Coutinho, Gonçalves, Travassos, et al., 2019b; Gonçalves et al., 2017).

Goalkeepers also appear particularly sensitive to pitch size, as smaller surfaces limit their exploratory range and anticipatory actions, while larger ones expand their tactical involvement in defensive space management (Jara et al., 2019).

Overall, larger pitches and greater relative space per player promote richer tactical expression—longer possessions, higher variability, and broader collective structures—while smaller or constrained spaces prioritize compactness and proximity. Pitch dimensions, shape, and imposed spatial restrictions thus emerge as key variables for coaches seeking to fine-tune team behavior during SSGs.

Effects of Task Rule Modifications on Tactical Engagement

Adjusting task rules in SSGs clearly shapes how teams organize offensively and defensively. Changes in scoring formats, such as the presence or absence of a goalkeeper or the number of scoring targets, mo-

dify how teams occupy space: more traditional scoring conditions tend to promote broader team structures, whereas alternative targets or floaters often compress the effective playing area and alter spacing dynamics (Castellano et al., 2016; Gonet et al., 2020).

The primary objective imposed by the rules—whether prioritizing ball retention or goal progression—also influences attacking dynamics. Possession-focused tasks typically generate longer passing sequences and greater collective involvement, while rules emphasizing forward progression encourage more direct and vertical play, especially in small formats with high interaction density (Machado, Ribeiro, et al., 2019b; Machado et al., 2016). Even pedagogical constraints designed for youth training, such as representation or exaggeration, appear to support similar adaptive tactical tendencies despite limited differences in decision-making metrics (Serra-Olivares et al., 2015).

Verbal instructions from coaches act as an immediate lever for adjusting collective behavior. Defensive cues tend to promote compactness and ball recovery. In contrast, offensive guidance encourages greater dispersion and more passing, demonstrating how simple verbal constraints can shift perception–action couplings during play (Bastia et al., 2019). Visual field markings also modulate tactical behavior by structuring movement patterns. While such references enhance longitudinal or lateral synchronization, they may simultaneously restrict creativity by reducing effective playing space or limiting the variability of interactions (Coutinho et al., 2020; Coutinho, Gonçalves, Travassos, et al., 2019b).

Taken together, these findings show that task-rule manipulations substantially influence tactical engagement. Scoring modalities and target numbers reshape team geometry; objective-oriented rules modulate offensive rhythm and intent; verbal cues redirect collective focus; and visual markers refine coordination but may limit emergent flexibility. For coaches, these constraints constitute powerful tools for steering tactical behavior toward specific learning goals.

Effects of Age and Competitive Level on tactical engagement

Age and competitive experience clearly shape how players organize collectively during SSGs. Older players tend to use space more efficiently, displaying greater dispersion, broader lateral occupation, and more stable collective structures—patterns that reflect their superior ability to manage width, circulate the ball, and maintain balanced attack–defense organization (Olthof et al., 2015; Barnabé et al., 2016; Clemente, Castillo, et al., 2020). Biological maturation reinforces this trend: more mature players adopt more effective offensive actions, whereas less mature ones show higher variability and less stability in collective behaviors (Reis & Almeida, 2020).

Tactical skill level further differentiates players' ability to coordinate collectively. More tactically competent players tend to produce smoother attacking interactions, greater offensive efficiency, and more exploratory behaviors, highlighting how expertise amplifies the tactical benefits associated with age (Machado, Barreira, et al., 2019a). Similarly, slight age-category differences can already influence collective engagement: older youth players show more efficient offensive coverage and better structural organization, particularly when spatial constraints are adjusted to their developmental stage (Moreira et al., 2020).

Competitive level also plays an important role in modulating emergent behavior. Although comparisons across playing levels are limited, evidence suggests that experience and expertise enhance players' adaptability to constraints such as numerical imbalances. At the same time, maturation alone does not fully explain performance differences (Nunes et al., 2020).

Overall, older, more mature, and more tactically skilled players tend to display greater spatial control, more stable collective patterns, and higher tactical efficiency. Younger or less experienced players, while often more variable and more vertical in their behavior, exhibit distinct exploratory tendencies. These findings highlight the need to tailor SSG constraints—formats, space, rules, and task demands—to players' developmental stage, maturation, and competitive background.

Other Integrated Effects

Beyond traditional manipulations of format, pitch size, and rules, several studies examined additional factors that influence collective engagement in SSGs. Fatigue emerged as a consistent disruptor of tactical coordination, as both mental and muscular fatigue were shown to impair players' ability to maintain stable collective patterns, reduce synchronization, and alter interpersonal distances—highlighting the

sensitivity of collective behavior to cognitive and physical load (Coutinho et al., 2017; Coutinho et al., 2018). Physical fitness, however, does not appear to exert the same influence. Differences in aerobic capacity produced only minimal effects on tactical actions and interaction networks, suggesting that collective behaviors in SSGs depend more on contextual and tactical demands than on isolated physiological qualities (Praça et al., 2019). Tactical formations also proved to be a decisive structural factor. Different positional structures modified teams' spatial occupation, attacking expansion, defensive compactness, and even the organization of the opposing team, reinforcing the idea that collective dynamics are highly sensitive to the organizational frameworks imposed during play (Gonzalez-Rodenas et al., 2024).

Overall, these findings show that integrated factors, such as fatigue and tactical formations, shape coordination and spatial structure in ways that extend beyond classical task constraints, underscoring the need for coaches to consider these variables when designing training environments carefully.

Limitations, Practical Implications, and Future Research Directions

Despite the richness of the findings, several limitations should be acknowledged. From a methodological standpoint, the included studies generally involved relatively small samples, often drawn from specific age categories or competition levels, which may limit the generalizability of the conclusions. Moreover, the lack of longitudinal studies restricts understanding of the long-term effects of SSGs on tactical engagement. In addition, limiting inclusion to English-language publications may have resulted in the exclusion of relevant studies published in other languages. Furthermore, the high heterogeneity of study protocols prevented the performance of a quantitative meta-analysis. Compared with other systematic reviews focusing on physical load or technical performance, our findings similarly emphasize the importance of contextual and tactical constraints but more precisely highlight the impact of manipulating small-sided game constraints (formats, rules, and pitch configurations) on spatial organization and collective engagement.

These results provide concrete practical implications for coaches: manipulating game formats, pitch size and configuration, task rules, and verbal instructions—as well as using "floater" players or visual reference markers—represents an effective lever for modulating tactical behaviors and balancing collective performance with individual participation. Considering players' age, biological maturation, and skill level allows coaches to tailor constraints to maximize learning and tactical involvement.

For future research, it would be relevant to conduct randomized controlled trials comparing different SSG formats on variables such as space occupation, movement regularity, offensive creativity, and defensive synchronization over extended periods to assess long-term effects. Comparative studies across competitive levels and age categories also help better understand the evolution of tactical behavior and guide tailored recommendations for player development. Finally, integrating combined physical, technical, and tactical data could provide a more holistic and accurate assessment of collective engagement during small-sided games.

Conclusions

This systematic review aimed to analyze the influence of small-sided games (SSGs) on football players' tactical engagement. The results demonstrate that SSGs represent a highly adaptable tactical tool, in which constraints related to format, pitch size, rules, and coach instructions predictably influence both individual and collective behaviors. These findings confirm that SSGs can be strategically employed to develop tailored tactical principles for players' profiles and training objectives. Finally, future research—including controlled trials and the integration of physical, technical, and tactical measures—is required to deepen understanding of collective adaptations and to optimize integrated training approaches in football.

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References

Aguiar, M., Botelho, G., Lago, C., Maças, V., & Sampaio, J. (2012). A Review on the Effects of Soccer Small-Sided Games. Journal of Human Kinetics, 33(2012), 103–113. https://doi.org/10.2478/v10078-012-0049-x

Aguiar, M., Gonçalves, B., Botelho, G., Lemmink, K., & Sampaio, J. (2015). Footballers' movement behaviour during 2-, 3-, 4- and 5-a-side small-sided games. Journal of Sports Sciences, 33(12), 1259–1266. https://doi.org/10.1080/02640414.2015.1022571

Bach Padilha, M., Guilherme, J., Serra-Olivares, J., Roca, A., & Teoldo, I. (2017). The influence of floaters on players' tactical behaviour in small-sided and conditioned soccer games. International Journal of Performance Analysis in Sport, 17(5), 721–736. https://doi.org/10.1080/24748668.2017.1390723

Barnabé, L., Volossovitch, A., Duarte, R., Ferreira, A. P., & Davids, K. (2016). Age-related effects of practice experience on collective behaviours of football players in small-sided games. Human Movement Science, 48, 74–81. https://doi.org/10.1016/j.humov.2016.04.007

Bastia, Batista, J., Goncalves, B., Research Centre in Sports Sciences, Health Sciences and Human Development (CIDESD), Vila Real, Portugal, Sampaio, J., Research Centre in Sports Sciences, Health Sciences and Human Development (CIDESD), Vila Real, Portugal, Castro, J., University Institute of Maia, Department of Physical Education and Sports Sciences (ISMAI), Maia, Portugal, Abade, E., University Institute of Maia, Department of Physical Education and Sports Sciences (ISMAI), Maia, Portugal, Travassos, B., & Research Centre in Sports Sciences, Health Sciences and Human Development (CIDESD), Vila Real, Portugal. (2019). The Influence of Coaches' Instruction on Technical Actions, Tactical Behaviour, and External Workload in Football Small-Sided Games. Montenegrin Journal of Sports Science and Medicine, 8(1), 29–36. https://doi.org/10.26773/mjssm.190305

Bujalance-Moreno, P., Latorre-Román, P. Á., & García-Pinillos, F. (2019). A systematic review on small-sided games in football players: Acute and chronic adaptations. Journal of Sports Sciences, 37(8), 921–949. https://doi.org/10.1080/02640414.2018.1535821

Canton, A., Torrents, C., Ric, A., Gonçalves, B., Sampaio, J., & Hristovski, R. (2019). Effects of Temporary Numerical Imbalances on Collective Exploratory Behavior of Young and Professional Football Players. Frontiers in Psychology, 10, 1968. https://doi.org/10.3389/fpsyg.2019.01968

Castellano, J., Silva, P., Usabiaga, O., & Barreira, D. (2016). The influence of scoring targets and outer-floaters on attacking and defending team dispersion, shape and creation of space during small-sided soccer games. Journal of Human Kinetics, 51(1), 153–163. https://doi.org/10.1515/hukin-2015-0178

Chootsungnoen, P., Leenoi, P., & Suwannate, C. (2025). The influence of number of floater players on internal and external load in small-sided games. Retos, 68, 299–307. https://doi.org/10.47197/retos.v68.112986

Clemente, F. M. (2014). Developing Aerobic and Anaerobic Fitness Using Small-Sided Soccer Games: Methodological Proposals. 36(3). https://doi.org/10.1519/SSC.0000000000000063

Clemente, F. M., Afonso, J., Castillo, D., Arcos, A. L., Silva, A. F., & Sarmento, H. (2020). The effects of small-sided soccer games on tactical behavior and collective dynamics: A systematic review. Chaos, Solitons & Fractals, 134, 109710. https://doi.org/10.1016/j.chaos.2020.109710

Clemente, F. M., Castillo, D., & Los Arcos, A. (2020). Tactical Analysis According to Age-level Groups during a 4 vs. 4 Plus Goalkeepers Small-sided Game. International Journal of Environmental Research and Public Health, 17(5), 1667. https://doi.org/10.3390/ijerph17051667

Clemente, F. M., Chen, Y.-S., Bezerra, J. P., Guiomar, J., & Lima, R. (2018). Between-format differences and variability of technical actions during small-sided soccer games played by young players. Human Movement, 2018(5), 114–120. https://doi.org/10.5114/hm.2018.83103

Clemente, F. M., Sequeiros, J. B., Correia, A., Silva, F. G. M., & Martins, F. M. L. (2018). Computational Metrics for Soccer Analysis. Springer International Publishing. https://doi.org/10.1007/978-3-319-59029-5

Coutinho, D., Gonçalves, B., Santos, S., Travassos, B., Wong, D. P., & Sampaio, J. (2019a). Effects of the pitch configuration design on players' physical performance and movement behaviour during soccer small-sided games. Research in Sports Medicine, 27(3), 298–313. https://doi.org/10.1080/15438627.2018.1544133

Coutinho, D., Gonçalves, B., Travassos, B., Abade, E., Wong, D. P., & Sampaio, J. (2019b). Effects of pitch spatial references on players' positioning and physical performances during football small-sided games. Journal of Sports Sciences, 37(7), 741–747. https://doi.org/10.1080/02640414.2018.1523671

Coutinho, D., Gonçalves, B., Travassos, B., Folgado, H., Figueira, B., & Sampaio, J. (2020). Different Marks in the Pitch Constraint Youth Players' Performances During Football Small-sided Games. Research Quarterly for Exercise and Sport, 91(1), 15–23. https://doi.org/10.1080/02701367.2019.1645938

Coutinho, D., Gonçalves, B., Travassos, B., Wong, D. P., Coutts, A. J., & Sampaio, J. E. (2017). Mental Fatigue and Spatial References Impair Soccer Players' Physical and Tactical Performances. Frontiers in Psychology, 8, 1645. https://doi.org/10.3389/fpsyg.2017.01645

Coutinho, D., Gonçalves, B., Wong, D. P., Travassos, B., Coutts, A. J., & Sampaio, J. (2018). Exploring the effects of mental and muscular fatigue in soccer players' performance. Human Movement Science, 58, 287–296. https://doi.org/10.1016/j.humov.2018.03.004

Folgado, H., Bravo, J., Pereira, P., & Sampaio, J. (2019). Towards the use of multidimensional performance indicators in football small-sided games: The effects of pitch orientation. Journal of Sports Sciences, 37(9), 1064–1071. https://doi.org/10.1080/02640414.2018.1543834

Francesco Sgrò, Salvatore Bracco, Salvatore Pignato, & Mario Lipoma. (2018). Small-Sided Games and Technical Skills in Soccer Training: Systematic Review and Implications for Sport and Physical Education Practitioners. Journal of Sports Science, 6(1). https://doi.org/10.17265/2332-7839/2018.01.002

García-Angulo, A., Palao, J. M., Giménez-Egido, J. M., García-Angulo, F. J., & Ortega-Toro, E. (2020). Effect of the Modification of the Number of Players, the Size of the Goal, and the Size of the Field in Competition on the Play Actions in U-12 Male Football. International Journal of Environmental Research and Public Health, 17(2), 518. https://doi.org/10.3390/ijerph17020518

Gonçalves, B., Esteves, P., Folgado, H., Ric, A., Torrents, C., & Sampaio, J. (2017). Effects of Pitch Area-Restrictions on Tactical Behavior, Physical, and Physiological Performances in Soccer Large-

Sided Games. Journal of Strength and Conditioning Research, 31(9), 2398–2408. https://doi.org/10.1519/JSC.0000000000001700

Gonçalves, B., Marcelino, R., Torres-Ronda, L., Torrents, C., & Sampaio, J. (2016). Effects of emphasising opposition and cooperation on collective movement behaviour during football small-sided games. Journal of Sports Sciences, 34(14), 1346–1354. https://doi.org/10.1080/02640414.2016.1143111

Gonet, D. T., Bezerra, L. O., Reis, M. A. M. D., & Vasconcellos, F. V. D. A. (2020). Effect of small-sided games with manipulation of small targets on the perceived exertion and tactical and technical performance of college soccer players. Revista Brasileira de Cineantropometria & Desempenho Humano, 22, e57958. https://doi.org/10.1590/1980-0037.2020v22e57958

Gonzalez-Rodenas, J., Ferrandis, J., Carril-Valdó, J., Claver-Rabaz, F., Ballester, R., & Gil-Arias, A. (2024). Effects of Different Tactical Formations on Positional Team Behaviors during Small Sided Games in Youth Soccer Players. Journal of Human Kinetics. https://doi.org/10.5114/jhk/194071

Greco, P. J., & Moreira Praça, G. (2017). Network analysis in small-sided and conditioned soccer games: The influence of additional players and playing position. Kinesiology, 49(2), 185–193. https://doi.org/10.26582/k.49.2.8

Halouani, J., Chtourou, H., Gabbett, T., Chaouachi, A., & Chamari, K. (n.d.). SMALL-SIDED GAMES IN TEAM SPORTS TRAINING: A BRIEF REVIEW. Journal of Strength and Conditioning Research. https://doi.org/10.1519/JSC.0000000000000564

Hill-Haas, S. V., Dawson, B., Impellizzeri, F. M., & Coutts, A. J. (2011). Physiology of Small-Sided Games Training in Football: A Systematic Review. Sports Medicine, 41(3), 199–220. https://doi.org/10.2165/11539740-000000000-00000

Jara, D., Ortega, E., Gómez-Ruano, M.-Á., Weigelt, M., Nikolic, B., & Sainz De Baranda, P. (2019). Physical and Tactical Demands of the Goalkeeper in Football in Different Small-Sided Games. Sensors, 19(16), 3605. https://doi.org/10.3390/s19163605

Machado, J. C., Alcântara, C., Palheta, C., Santos, J. O. L. D., Barreira, D., & Scaglia, A. J. (2016). The influence of rules manipulation on offensive patterns during small-sided and conditioned games in football. Motriz: Revista de Educação Física, 22(4), 290–298. https://doi.org/10.1590/s1980-6574201600040012

Machado, J. C., Barreira, D., Teoldo, I., Travassos, B., Júnior, J. B., Santos, J. O. L. D., & Scaglia, A. J. (2019a). How Does the Adjustment of Training Task Difficulty Level Influence Tactical Behavior in Soccer? Research Quarterly for Exercise and Sport, 90(3), 403–416. https://doi.org/10.1080/02701367.2019.1612511

Machado, J. C., Ribeiro, J., Palheta, C. E., Alcântara, C., Barreira, D., Guilherme, J., Garganta, J., & Scaglia, A. J. (2019b). Changing Rules and Configurations During Soccer Small-Sided and Conditioned Games. How Does It Impact Teams' Tactical Behavior? Frontiers in Psychology, 10, 1554. https://doi.org/10.3389/fpsyg.2019.01554

Martone, D., Giacobbe, M., Capobianco, A., Imperlini, E., Mancini, A., Capasso, M., Buono, P., & Orrù, S. (2017). Exercise Intensity and Technical Demands of Small-Sided Soccer Games for Under-12 and Under-14 Players: Effect of Area per Player. Journal of Strength and Conditioning Research, 31(6), 1486–1492. https://doi.org/10.1519/JSC.0000000000001615

Memmert, D., Lemmink, K. A. P. M., & Sampaio, J. (2017). Current Approaches to Tactical Performance Analyses in Soccer Using Position Data. Sports Medicine, 47(1), 1–10. https://doi.org/10.1007/s40279-016-0562-5

Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2010). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. International Journal of Surgery, 8(5), 336–341. https://doi.org/10.1016/j.ijsu.2010.02.007

Moreira, P. E. D., Barbosa, G. F., Murta, C. D. C. F., Pérez Morales, J. C., Bredt, S. D. G. T., Praça, G. M., & Greco, P. J. (2020). Network analysis and tactical behaviour in soccer small-sided and conditioned games: Influence of absolute and relative playing areas on different age categories. International Journal of Performance Analysis in Sport, 20(1), 64–77. https://doi.org/10.1080/24748668.2019.1705642

Muhyi, M., Suharti, S., Puspodari, P., Syarif, A., Nugroho Putro, B., Cahyanto Wibawa, J., & Ayubi, N. (2025). Physiological mechanisms of increasing maximal oxygen volume through small sided games training: A systematic review. Retos, 69, 1215–1225. https://doi.org/10.47197/retos.v69.116525

Nunes, N. A., Gonçalves, B., Coutinho, D., & Travassos, B. (2020). How Numerical Unbalance Constraints Physical and Tactical Individual Demands of Ball Possession Small-Sided Soccer Games. Frontiers in Psychology, 11, 1464. https://doi.org/10.3389/fpsyg.2020.01464

Olthof, S. B. H., Frencken, W. G. P., & Lemmink, K. A. P. M. (2015). The older, the wider: On-field tactical behavior of elite-standard youth soccer players in small-sided games. Human Movement Science, 41, 92–102. https://doi.org/10.1016/j.humov.2015.02.004

Olthof, S. B. H., Frencken, W. G. P., & Lemmink, K. A. P. M. (2018). Match-derived relative pitch area changes the physical and team tactical performance of elite soccer players in small-sided soccer games. Journal of Sports Sciences, 36(14), 1557–1563. https://doi.org/10.1080/02640414.2017.1403412

Olthof, S. B. H., Frencken, W. G. P., & Lemmink, K. A. P. M. (2019). A Match-Derived Relative Pitch Area Facilitates the Tactical Representativeness of Small-Sided Games for the Official Soccer Match. Journal of Strength and Conditioning Research, 33(2), 523–530. https://doi.org/10.1519/JSC.0000000000002978

Ometto, L., Vasconcellos, F. V., Cunha, F. A., Teoldo, I., Souza, C. R. B., Dutra, M. B., O'Sullivan, M., & Davids, K. (2018). How manipulating task constraints in small-sided and conditioned games shapes emergence of individual and collective tactical behaviours in football: A systematic review. International Journal of Sports Science & Coaching, 13(6), 1200–1214. https://doi.org/10.1177/1747954118769183

Parlebas, P. (2020). The Universals of Games and Sports. Frontiers in Psychology, 11, 593877. https://doi.org/10.3389/fpsyg.2020.593877

Praça, G. M., Costa, C. L. A., Falconi, F., Andrade, A. G. P. D., Chagas, M. H., & Greco, P. J. (2016). Influência do conhecimento tático processual no comportamento tático durante diferentes pequenos jogos no futebol. Journal of Physical Education, 27(1), 2736. https://doi.org/10.4025/jphyseduc.v27i1.2736

Praça, G. M., Folgado, H., Andrade, A. G. P. D., & Greco, P. J. (2016). Comportamento tático coletivo em Pequenos Jogos no Futebol: Influência de jogadores adicionais. Brazilian Journal of Kinanthropometry and Human Performance, 18(1), 62. https://doi.org/10.5007/1980-0037.2016v18n1p62

Praça, G. M., Sousa, R. B. E., & Greco, P. J. (2019). Influence of Aerobic Power on Youth Players' Tactical Behavior and Network Properties during Football Small-Sided Games. Sports, 7(3), 73. https://doi.org/10.3390/sports7030073

Reis, M. A. M. D., & Almeida, M. B. (2020). The role of somatic maturation in the tactical effectiveness, efficiency and variability of young soccer players. International Journal of Performance Analysis in Sport, 20(2), 305–321. https://doi.org/10.1080/24748668.2020.1743165

Ric, A., Hristovski, R., Gonçalves, B., Torres, L., Sampaio, J., & Torrents, C. (2016). Timescales for exploratory tactical behaviour in football small-sided games. Journal of Sports Sciences, 34(18), 1723–1730. https://doi.org/10.1080/02640414.2015.1136068

Sarmento, H., Clemente, F. M., Araújo, D., Davids, K., McRobert, A., & Figueiredo, A. (2018). What Performance Analysts Need to Know About Research Trends in Association Football (2012–2016): A Systematic Review. Sports Medicine, 48(4), 799–836. https://doi.org/10.1007/s40279-017-0836-6

Sarmento, H., Clemente, F. M., Harper, L. D., Costa, I. T. D., Owen, A., & Figueiredo, A. J. (2018). Small sided games in soccer – a systematic review. International Journal of Performance Analysis in Sport, 18(5), 693–749. https://doi.org/10.1080/24748668.2018.1517288

Serra-Olivares, J., González-Víllora, S., García-López, L. M., & Araújo, D. (2015). Game-Based Approaches' Pedagogical Principles: Exploring Task Constraints in Youth Soccer. Journal of Human Kinetics, 46(1), 251–261. https://doi.org/10.1515/hukin-2015-0053

Silva, P., Esteves, P., Correia, V., Davids, K., Araújo, D., & Garganta, J. (2015). Effects of manipulations of player numbers vs. Field dimensions on inter-individual coordination during small-sided games in youth football. International Journal of Performance Analysis in Sport, 15(2), 641–659. https://doi.org/10.1080/24748668.2015.11868821

Silva, P., Vilar, L., Davids, K., Araújo, D., & Garganta, J. (2016). Sports teams as complex adaptive systems: Manipulating player numbers shapes behaviours during football small-sided games. SpringerPlus, 5(1), 191. https://doi.org/10.1186/s40064-016-1813-5

Torrents, C., Ric, A., Hristovski, R., Torres-Ronda, L., Vicente, E., & Sampaio, J. (2016). Emergence of Exploratory, Technical and Tactical Behavior in Small-Sided Soccer Games when Manipulating the Number of Teammates and Opponents. PLOS ONE, 11(12), e0168866. https://doi.org/10.1371/journal.pone.0168866

Travassos, B., Gonçalves, B., Marcelino, R., Monteiro, R., & Sampaio, J. (2014). How perceiving additional targets modifies teams' tactical behavior during football small-sided games. Human Movement Science, 38, 241–250. https://doi.org/10.1016/j.humov.2014.10.005

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