



Group cohesion in football: a scoping review and bibliometric analysis (1996-2024)

La cohesión grupal en el fútbol: una revisión de alcance y análisis bibliométrico (1996-2024)

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Received: 01-09-25

Accepted: 05-12-25

How to cite in APA

Schena, F., Oliveira de Carvalho, M., & Mendes Caparo, A.. (2026). Group cohesion in football: a scoping review and bibliometric analysis (1996-2024). *Retos*, 76, 24-39.
<https://doi.org/10.47197/retos.v76.117507>

Abstract

Introduction: Group cohesion, understood as the dynamic process that reflects a team's tendency to remain united in the pursuit of common goals and achieving the socio-affective needs of its members, is a decisive factor for performance in team sports. In football, however, while technical and tactical advances are extensively documented, human and social dimensions remain less explored, resulting in a fragmented body of literature.

Objective: To map and analyse the scientific production on group cohesion in football published between 1996 and 2024.

Methodology: A scoping review supported by bibliometric techniques was conducted using data collected from Scopus and Web of Science. Sixty-four articles were identified and examined with regard to temporal evolution, authorship networks, journals, instruments employed, geographical distribution, and sample characteristics.

Results: Studies predominantly involved male youth samples, with limited participation of coaches and elite clubs. The scientific output also revealed temporal trends and networks of collaboration among authors, with greater concentration in Spain and Canada.

Discussion: The findings confirm the fragmented nature of the field and the under-representation of women's and elite-level football, contrasting with the recognised importance of cohesion for sporting success.

Conclusions: Significant gaps were identified in the literature, reinforcing the need to broaden methodological and sample diversity. This study provides a comprehensive overview to guide future research and support team management strategies, such as the systematic application of validated instruments.

Keywords

Football (soccer), group cohesion, scoping review, sport psychology, team dynamics.

Resumen

Introducción: La cohesión de grupo, entendida como el proceso dinámico que expresa la tendencia de un equipo a mantenerse unido en la consecución de objetivos comunes y en la satisfacción de las necesidades socioafectivas de sus miembros, constituye un factor decisivo para el rendimiento en los deportes colectivos. En el fútbol, sin embargo, aunque los avances técnicos y tácticos están ampliamente documentados, las dimensiones humanas y sociales permanecen menos exploradas, lo que refleja una literatura aún fragmentada.

Objetivo: Mapear y analizar la producción científica sobre cohesión de grupo en el fútbol publicada entre 1996 y 2024.

Metodología: Se llevó a cabo una revisión de alcance con apoyo de técnicas bibliométricas, a partir de datos recopilados en las bases Scopus y Web of Science. Se identificaron 64 artículos, examinados en relación con la evolución temporal, redes de autoría, revistas, instrumentos empleados, distribución geográfica y características de las muestras.

Resultados: Predominaron los estudios con muestras masculinas de categorías formativas, con una reducida participación de entrenadores y clubes de élite. La producción científica también reveló la evolución temporal y las redes de colaboración entre autores, con mayor concentración en España y Canadá.

Discusión: Los hallazgos confirman la fragmentación del campo y la infrarepresentación del fútbol femenino y de alto rendimiento, en contraste con la reconocida relevancia de la cohesión para el éxito deportivo.

Conclusiones: Se identificaron lagunas significativas en la literatura, lo que refuerza la necesidad de ampliar la diversidad metodológica y muestral. El estudio ofrece un panorama amplio para orientar futuras investigaciones y sustentar estrategias de gestión de equipos, como la aplicación sistemática de instrumentos validados.

Palabras clave

Cohesión de grupo, dinámica de equipo, fútbol, psicología del deporte, revisión de alcance.

Introduction

Over the last two decades, there has been consistent development in football training methods, nutrition, technical match analysis, and injury prevention and treatment, driven by scientific discoveries and the development of new technologies and analytical methodologies. However, the human aspects (social, cultural, emotional) that surround football athlete development are often overlooked, and there is still a general and mistaken perception that football players are born with innate talent (Marques & Januário, 2018; Pacheco, 2017).

One of the human factors that can directly influence sporting performance and the quality of the game and spectacle is group cohesion within teams (Carron et al., 2002). Cohesion can be defined as “a dynamic process that reflects the tendency of a group to stick together and remain united in the pursuit of its instrumental objectives and/or for the satisfaction of members affective needs” (Carron et al., 1998, p. 213).

Within the field of sport psychology, group cohesion represents a central construct that encompasses the psychological bonds and motivational dynamics uniting athletes around collective objectives and interpersonal relationships (Carron et al., 1985; Deci & Ryan, 2000). This concept has been examined through multiple theoretical lenses, including its interactions with leadership (Chelladurai, 2007), motivational climate (Duda & Balaguer, 2007), collective efficacy (Bandura, 1997; Fransen et al., 2020) and emotional regulation (Gross, 2015; Tamminen et al., 2014) all of which are essential for understanding both individual and team performance in team sports such as football (Filho et al., 2014; Leo et al., 2022). Due to the importance attributed to cohesion and other group variables in sports teams, coaches and athletes often seek to engage in activities that facilitate group functioning (Quintana Otero et al., 2025).

When discussing group cohesion, it is implicitly understood that a strong bond between individuals is essential for a team's success. It is worth noting that this topic is not only relevant to the world of sport but has also been explored in other contexts. Mullen and Copper (1994), for instance, conducted a meta-analysis of 49 studies across occupational contexts (industrial, sporting, military, social). They reported that: 1) the relationship between cohesion and team success is positive; 2) “real groups” (e.g., football teams) exhibit significantly stronger effects than “artificial groups” (e.g., regionally unionised athletes); and 3) sports teams show even stronger effects than non-sporting real groups. However, despite the valuable contributions of this study, Carron (2002) argued that the data collection, conducted via a non-standardised questionnaire based on a conceptual framework still under development, presented psychometric properties not fully validated for the sports context, potentially introducing biases into the analysis. This prompted Carron to further explore the topic, influencing significant academic production worldwide.

Given this growth and the diversity of approaches found in recent literature, it becomes necessary to systematise this body of knowledge, providing a consistent overview for researchers and others interested in the topic. Thus, this study is guided by two central questions: (a) how the scientific literature has addressed group cohesion in the context of football; and (b) how this body of research is distributed over time, across authors, countries, research instruments, and specific themes.

In this regard, a scoping review combined with bibliometric analysis is particularly appropriate for identifying the conceptual evolution of this field of study. While the scoping review enables the mapping of concepts, methods, and research gaps, bibliometrics complements this approach by quantifying productivity, impact, collaboration networks, temporal trends, and thematic clusters within the literature, providing a macro-structural perspective on the scientific development of cohesion research in football (Donthu et al., 2021).

This study aims to map the scientific literature on group cohesion in football, focusing on psychological approaches by analysing publications indexed in the Web of Science and Scopus databases. This work seeks to understand the geographical spread of the theme, highlight the main authors, present the diversity of approaches and subtopics involved, identify the most frequently used journals, explore networks of collaboration, and showcase the most influential studies. It also addresses the most employed research methods and categorises the sample populations by gender, age group (child, youth, adult) and competitive level (amateur, semi-professional, professional) seeking to understand analytical patterns and gaps to guide researchers and interested parties.



Method

To map and critically organise the scientific literature on group cohesion in football (soccer), a scoping review was conducted based on the frameworks proposed by Arksey and O'Malley (2005) and Levac et al. (2010), aligned with the Joanna Briggs Institute (JBI) methodology. The approach combined interpretive analysis with bibliometric techniques (including author frequency, co-authorship networks, publication journals, etc.), while maintaining the instrumental nature of quantitative tools (Zitt et al., 2019). To ensure transparency, the PRISMA-ScR guidelines (Tricco et al., 2018) were followed, with the completed checklist available as Supplementary Material as List S1. This strategy enabled the identification of patterns, gaps and trends to guide future research in sport psychology. Bibliometrics is a valuable tool for understanding and mapping the collective behaviour of scientific communities, as it identifies strategic aspects of publications and offers essential insights into research dynamics and emerging pathways for innovation. These aspects are important for assessing the impact of publications and guiding strategic decision-making in academia and in science policy (Zitt et al., 2019).

This approach becomes particularly relevant in fragmented or developing areas, such as studies on group cohesion in football. By integrating a scoping review with bibliometrics, it is possible to combine breadth with structural depth, allowing us to understand not only what has been researched, but how, by whom, and in which directions the field is organised, highlighting patterns, gaps, and trends that may guide future research. In the case of group cohesion - a multidimensional construct studied across different disciplinary fields - this approach is also particularly useful for revealing how distinct scientific traditions (psychology, sociology, anthropology, pedagogy, etc.) have contributed to its theoretical development.

The selected bibliometric variables - co-authorship networks among researchers, the geographical distribution of publications, productivity by authors and journals, keyword co-occurrence, and citation impact within the scientific community - are widely recognised as fundamental indicators for evaluating scientific fields. In the present study, each of these variables was chosen because it directly contributes to addressing the formulated research questions. Co-authorship networks help identify scientific communities and the most central authors, responding to the question of how knowledge on group cohesion in football is organised and circulates internationally. The geographical distribution of publications, complemented by the analysis of first authors' affiliations, enables an understanding of national research traditions and regional asymmetries, contributing to the question of where this knowledge is produced and which theoretical models tend to disseminate. Productivity by authors and journals reveals the most common channels of dissemination and the level of specialisation achieved, helping to identify the studies and researchers that structure the thematic debate. Finally, keyword co-occurrence analysis - a standard method for revealing the conceptual structure of a field (Waltman & Van Eck, 2012; Donthu et al., 2021) - addresses the question of which themes have predominated in the literature and which conceptual gaps remain open.

When addressing the role of different types of scientific content reviews, it is essential to adopt a well-organised structure based on clear, well-defined parameters to ensure the proper curation of articles. The following inclusion criteria were defined, aligned with the objectives of the review: 1) the article must be published in a peer-reviewed academic journal of broad acceptance and credibility, indexed in a recognised database; 2) it must have been published by the end of 2024; 3) it must address group cohesion in male or female football at any age category (child, youth, adult) and competitive level (recreational, amateur, semi-professional, professional); 4) it may address other sports, provided that football is also considered; 5) it may include related topics, as long as they are addressed alongside group cohesion. The exclusion criteria were: 1) review articles; and 2) articles that do not involve athletes.

The Web of Science and Scopus databases provide literature collections that accurately identify corresponding authors, offering essential infrastructure for scientific publication. Additionally, they ensure name disambiguation, so that publications are: 1) attributed to the correct researchers; 2) measured without contamination by similar names; 3) useful in building and maintaining researchers' academic reputations; 4) capable of mapping co-authorship and scientific collaboration between researchers and institutions; and 5) practical for accurate bibliometric data analysis, which can inform academic policy, funding allocation and research strategies (Krämer et al., 2017).



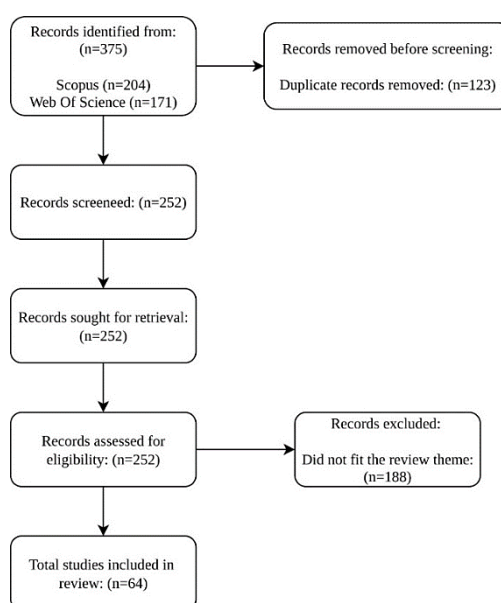
The period analysed spanned from 1996 (year of the first included article) to 31 December 2024. As this constitutes a scoping review with bibliometric support, it was essential to consider the entire available collection on the subject in order to understand the historical and analytical development of the research theme.

To search for the topic in the databases, the following descriptors in English language were used: "Group cohesion" OR "team cohesion" OR "group dynamics" OR "team chemistry" OR "social cohesion" OR "social identity" AND "football" OR "soccer" AND "players" OR "football players" OR "athletes". These terms were selected due to the multiplicity of related expressions and synonyms for "group cohesion". Additionally, care was taken to avoid contamination from unrelated football contexts, such as fan cohesion. Articles on American football were also excluded, as it is a different sport despite the shared name in many regions.

The search was conducted by topic, meaning that the descriptors were identified in the title, abstract, and keywords of the articles. However, it is important to note that there are subtle differences in how the results are presented across the two databases. In Web of Science, keywords are structured as follows: 1) Author keywords: these are the terms selected by the author of the article to describe the main themes addressed in the study, directly reflecting their own perspective on the core concepts of the research; 2) Keywords Plus: these are terms automatically generated based on the titles of articles cited in the references of the study. They allow for the identification of thematic trends and conceptual connections that may not be explicitly present in the keywords provided by the authors. Scopus, on the other hand, does not offer the "keywords plus" feature. Instead, it provides indexed terms based on standardised vocabularies, which are extracted and attributed to the article in order to support its classification and information retrieval. Functioning as a refinement of the topic-based search, these indexed terms may include concepts that do not appear directly in the search query but are nonetheless relevant to categorisation of articles (Mongeon & Paul-Hus, 2016).

The search using descriptors yielded 375 articles: 171 from Web of Science and 204 from Scopus. Duplicate articles available in both databases were identified, and 123 were excluded, leaving 252 potentially eligible articles. The next step involved reading titles and abstracts (and, in some cases, parts of the text) to ensure they met the review criteria. As a result, 188 articles were excluded due to significant misalignment with the theme or scope. In the end, 64 articles fully met the inclusion and exclusion criteria (the complete list is available in Supplementary Material as List S2). Figure 1 summarizes this selection process, according to the Prisma - ScR guidelines.

Figure 1. Flowchart of the article selection process



Source: Author's own elaboration.

A spreadsheet was then created containing the following data: 1) DOI; 2) Authors; 3) Year of publication; 4) Article title; 5) Abstract; 6) Methodology; 7) Number of authors; 8) Competition level; 9) Athlete age group; 10) Inclusion of coaches (Yes/No); 11) Sample size; 12) Additional sports; 13) Citation count; 14) Journal of publication; 15) Publisher; 16) Language; 17) Country of first author; 18) Keywords. Data were partly exported from the databases and processed by the Rayyan software (<https://www.rayyan.ai/>). Additional data were collected manually from the full texts.

Several digital tools were employed to enhance the analytical capacity regarding the variables present in each study. Rayyan enabled the export of database records and the detection of duplicate articles based on similarity indices, thereby streamlining and increasing the precision of the screening and organisational processes for reviews (Ouzzani et al., 2016). Using Bibliometrix, it was possible to create more comprehensive scientific mappings, providing an ideal foundation for bibliometric analyses and enabling the extraction of indicators such as the geographical distribution of publications, journal productivity, and patterns of collaboration among authors. This offers a robust quantitative overview of the development of scientific output on group cohesion in football (Aria & Cuccurullo, 2017). VOSviewer and Biblioshiny (the web interface of Bibliometrix) were used to construct high-quality bibliometric maps, facilitating the visualisation of the intellectual relationships within the field. These tools contributed especially to identifying thematic clusters through co-authorship, co-citation, and co-occurrence of terms, allowing for an understanding of how knowledge is organised and structured over time (van Eck & Waltman, 2009). Finally, Gephi enabled the exploration of graphs and networks through a rendering engine capable of handling complex datasets, producing valuable visual outputs, it was specifically employed to visualise co-authorship relationships and keyword connections (Bastian et al., 2009). It is important to emphasise that all these tools were used in a complementary manner, each contributing to specific dimensions of the bibliometric analysis.

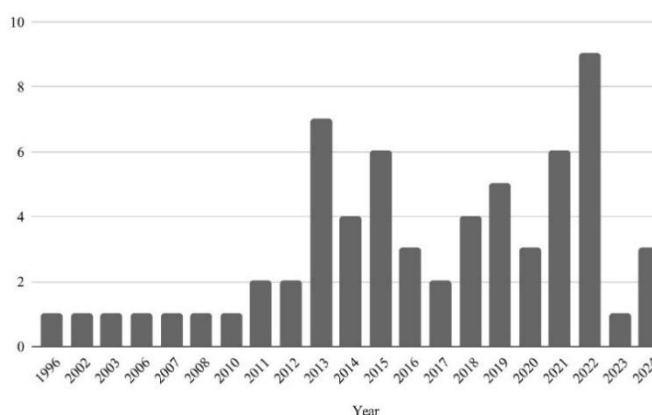
Results

With the spreadsheet fully completed, it was possible to organise and optimise the visualisation of the data from each item analysed.

Evolution of Publications Over the Years

Figure 2 presents the number of publications over the years, helping to identify trends in scientific interest in the subject, as well as periods of growth and stagnation in the literature.

Figure 2. Annual evolution of publications on group cohesion from 1996 to 2024



Source: Author's own elaboration.

From 1996 to 2010, scientific production on the topic remained limited, with only 7 publications over 14 years. Significant gaps were also observed, such as the absence of publications in the periods 1996–

2002, 2004–2006, and 2009. From 2010 onwards, interest in the topic increased, with consistent annual publications. Noteworthy years include 2013 (7 articles), 2015 (6 articles), 2021 (6 articles), and 2022 (9 articles). From 2013 to 2024, the average number of annual publications remained at 4.4. This growing publication output from 2010 onwards was driven by a core group of prolific researchers.

Leading Authors and Co-authorship Networks

Among the most prominent researchers publishing on this topic are Francisco Miguel Leo, Miguel Ángel López Gajardo and Inmaculada González Ponce, with 12, 4 and 2 articles respectively. As professors at the Universidad de Extremadura (Spain), much of their work has been developed through co-authorship, demonstrating productive and synergistic partnerships. Other noteworthy authors with 2 articles each include: Edson Filho (Università degli Studi "Gabriele d'Annunzio" Chieti–Pescara, Italy); Carla Chica Borrego (Instituto Politécnico de Santarém, Portugal); Colen McLaren (University of Saskatchewan, Canada); Matthew Pain (Loughborough University, United Kingdom); and Kevin Spink (University of Saskatchewan, Canada).

Figure S1 in the supplementary material illustrates the co-authorship network, highlighting the three main researchers (Leo, López Gajardo, and González Ponce) and their collaborations with authors from Extremadura and other Spanish universities (blue and green networks), as well as international partnerships (purple and red networks).

Leo and López Gajardo have the most extensive and global co-authorship networks, including collaborations with researchers from the University of Windsor, Wilfrid Laurier University, University of Western Ontario and University of Saskatchewan (all in Canada). There is also a smaller co-authorship network linking the University of Agder (Norway) to some Canadian institutions. Table 1 lists the authors with the highest number of publications and their respective co-authors, in descending order of relevance.

Table 1. Authors with the highest volume of publications and their respective co-authors, in descending order of relevance

Author	Co-authorship Network
Leo, Francisco M.	López-Gajardo, Miguel A.; González-Ponce, Inmaculada; Garcia-Calvo, Tomás; McLaren, Collin D.; Loughhead, Todd M.; Fransen, Katrien; Van Puyebroek, Stuf; Boen, Filip; Benson, Alex J.; Eyes, Mark.
López-Gajardo, Miguel A.	Leo, Francisco M.; González-Ponce, Inmaculada; Garcia-Calvo, Tomás; McLaren, Collin D.; Loughhead, Todd M.; Fransen, Katrien; Bruner, Mark W.; Boen, Filip; Diaz-Garcia, Jesús; Rubio Morales, Ana; Ilanos-Muñoz, Rubén; Benson, Alex J.; Eyes, Mark; Filho, Edson.
González-Ponce, Inmaculada	López-Gajardo, Miguel A.; Leo, Francisco M.; Garcia-Calvo, Tomás; Sanches-Oliva, David; Amado, Diana; Benson, Alex J.; Rubio-Morales, Ana; Diaz-Garcia, Jesús; Ponce-Pardon, José; Eyes, Mark.

Source: Author's own elaboration.

Beyond the productivity of the most publishing authors, the academic impact of the literature can be gauged through citation analysis.

Most Cited Articles and Academic Impact

Some articles by authors not necessarily central to the identified collaboration networks stand out due to their high citation counts in other impactful studies found in Scopus and Web of Science. These articles influence the academic community due to factors such as scientific relevance, methodological rigour, theoretical foundations, journal impact and practical applicability (Waltman, 2016). Table 2 presents the ten most cited articles.

Table 2. Most cited articles on group cohesion in football, including respective authors, year of publication, and average citations per year

Authors	Year	Article Theme	Citations	Avg. per year
Carron, Albert V.; Bray, Steven R.; Eys, Mark A.	2002	Team cohesion and team success in sport	195	8.86
Price, Melissa S.; Weiss, Maureen R	2013	Coach and peer leadership in adolescent athletes.	96	8.72
Høigaard, Rune; Säfvenbom, Reidar; Tønnessen, Finn Egil	2006	Group cohesion, norms and social loafing in soccer	80	4.4



Taylor, Ian M.; Bruner, Mark W.	2012	Social environment and youth football experiences	67	5.58
García-Calvo, Tomás et al.	2014	Motivational climates, cohesion and satisfaction	66	6.6
Filho, Edson et al.	2015	Cohesion, team mental models and collective efficacy	63	7
Pain, Matthew A.; Harwood, Chris	2007	Performance environment in England youth teams	45	2.64
Leo, Francisco M. et al.	2013	Cohesion and collective efficacy profiles in football	43	3.9
McLaren, Colin D.; Eys, Mark A.; Murray, Robyn A.	2015	Coach climate and youth group cohesion in sport	43	4.7
Prapavessis, Harry; Carron, Albert A.; Spink, Kevin S.	1996	Team building in sport	43	1.5

Source: Author's own elaboration.

To understand the methodological foundation of these studies, we analysed the data collection instruments employed across the sample.

Data Collection Instruments Used

It was found that in 95% of the works analysed in this review, questionnaires were used as the primary method of data collection, with most articles employing more than one questionnaire in their methodology. In total, 57 different questionnaires were used across the entire collection of articles analysed, of which 5 were developed by the authors themselves (mostly based on and adapted from pre-existing instruments) and 52 were created by other researchers. Table 3 lists the 14 questionnaires that were used in at least two articles, indicating their respective authors and the number of occurrences of each within the sample analysed in this review.

Table 3. Questionnaires used in two or more studies, with authors and frequency

Methodology	Author and Year	Frequency
Group Environment Questionnaire (GEQ)	Carron et al. (1985)	43
Perceived Motivational Climate in Sport Questionnaire (PMCSQ-2)	Walling et al. (1993)	8
Youth Sport Environment Questionnaire (YSEQ)	Eys et al. (2009)	8
Leadership Scale for Sports (LSS)	Chelladurai & Saleh (1980)	3
Football Collective Efficacy Questionnaire (FCEQ)	Filho et al. (2015)	3
Authentic Leadership Questionnaire (ALQ)	Walumbwa et al. (2008)	2
Behavioural Regulation in Sport Questionnaire (BRSQ)	Lonsdale et al. (2008)	2
Characteristics of Resilience in Sports Teams Inventory (CREST)	Decroos et al. (2017)	2
Child Sport Cohesion Questionnaire (CSCQ)	Eys et al. (2009)	2
Intragroup Team Conflict Scale (ITCS)	Tekleab et al. (2009)	2
Motivational Climate Scale for Youth Sport (MCSYS)	Smith et al. (2008)	2
Collective Efficacy Questionnaire	Leo et al. (2013)	2
Coach–Athlete Relationship Questionnaire (CART-Q)	Jowett & Ntoumanis (2004)	2
Perceived Coach Motivational Climate Questionnaire-2	Appleton et al. (2016)	2

Source: Author's own elaboration.

In addition to the Group Environment Questionnaire (GEQ), which appeared in 43 studies, the Perceived Motivational Climate in Sport Questionnaire (PMCSQ-2) and Youth Sport Environment Questionnaire (YSEQ) were also noteworthy, each used in eight studies.

Only three articles adopted alternative methods to questionnaires for data collection: two employed interviews, and one obtained information from a database hosted on a website that monitors data on players, clubs, and matches. The scientific discourse on this topic has been primarily disseminated through a select group of key journals.

Most Relevant Journals

The journals with the highest number of publications and that demonstrated relevance in the scientific dissemination of the topic are: 1) Psychology of Sport and Exercise (7 articles); 2) Journal of Sports Sciences (6 articles); and 3) International Journal of Sport Psychology (4 articles). Figure S2 illustrates the editorial progression of the journals in relation to publications on the topic over the past decades.



Until 2020, the Journal of Sports Sciences was the leading journal in the field of group cohesion in football. From that point onward, Psychology of Sport and Exercise assumed the top position as the main publication forum for this topic.

Three other journals had three publications each: Cuadernos de Psicología del Deporte, Journal of Human Kinetics, and Sport, Exercise, and Performance Psychology. Additionally, three journals had two publications each: International Journal of Sports Science and Coaching, Revista de Psicología del Deporte, and Revista Internacional de Medicina y Ciencias de la Actividad Física y del Deporte.

Complementing the analysis of publication outlets, the geographical distribution of the research efforts reveals the global centres of knowledge production on group cohesion in football.

Geographical Distribution of Scientific Production

Table 4 presents the countries affiliated with the first authors of the articles included in this review and the number of publications per country:

Table 4. Article distribution by country of first author's affiliation

Country	No. of Articles	Country	No. of Articles
Spain	22	Germany	1
Canada	10	Australia	1
Brazil	4	Croatia	1
United States	4	Netherlands	1
United Kingdom	4	Iraq	1
Turkey	3	Israel	1
Greece	2	Mexico	1
Italy	2	Romania	1
Norway	2	Ukraine	1
Portugal	2		

Source: Author's own elaboration.

The affiliation of the first author is an important bibliometric indicator, as it helps to clarify the geographical and political dimensions of knowledge production. It provides information on local research traditions, styles, and preferences, as well as on the asymmetries between different regions of the globe (Zitt et al., 2019). In the field of group cohesion in football, this finding may indicate the level of research and sporting infrastructure, scientific funding, and local academic tradition, as well as help to understand how certain theoretical models are disseminated. One example of this dynamic is the GEQ, which appears in most of the articles in this sample and, despite originating in a country with a lesser football tradition, such as Canada, has exerted international influence on scientific production.

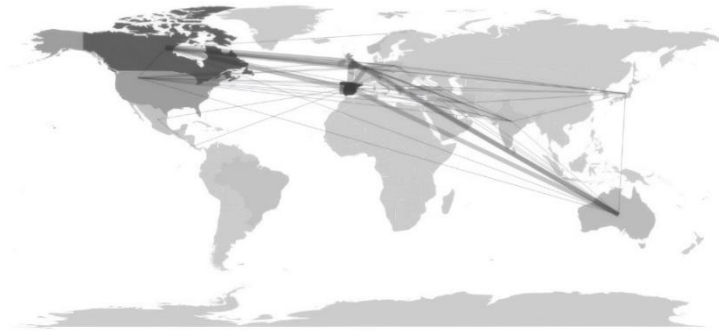
Among the countries where the most productive lead researchers are based, Spain stands out with 22 articles, accounting for approximately 34% of the world's relevant scientific output on the subject. The Universidad de Extremadura emerges as the principal locus of academic discussion on group cohesion in football, with 18 articles published. Also contributing to Spanish research, albeit with one publication each, are the Universities of Deusto, Valencia, Zaragoza, and Miguel Hernández de Elche.

Next, Canada appears with 10 publications, notably from the University of Saskatchewan (3 articles), Wilfrid Laurier University (3 articles), University of Windsor (2 articles), and one each from the University of Western Ontario and Western University London. It is worth noting that Canada held the leading position in this area of study until 2020, when it was surpassed by Spain.

Brazil and the United States of America each produced four publications, but without a single university emerging as the locus of more than one article. The United Kingdom also contributed four publications, with a notable concentration of research stemming from Loughborough University, which accounts for three of them.

In the world map represented in Figure 3, the data refer to the institutional affiliations of both first authors and co-authors, allowing for the visualisation of a broader international collaboration network, represented by lines connecting different countries.

Figure 3. International co-authorship network



Source: Author's own elaboration.

The map (Figure 3) shows countries based on the institutional affiliation of first authors and co-authors, providing a broader view of international collaboration. The colour density reflects the number of publications per country, while the thickness of the connecting lines indicates the level of collaboration. Spain and Canada occupy central roles, followed by the United Kingdom, Australia, the United States, Japan, Belgium and India. Although Brazil has a presence in the field, its researchers were not integrated into any major international collaboration networks.

Having established the geographical and temporal landscape of the literature, this paper now turns to the characteristics of the study samples to understand the populations that have been the focus of this research.

Sample Characteristics

Across the 64 articles reviewed, the total sample comprised 15,338 participants (15,270 athletes and 68 coaches), with 4,244 female and 11,094 male participants, resulting in an average of 239.6 participants per study. Only five studies involved coaches (63 men and 5 women). This sample was further characterised by level of competition, biological sex, and age group.

Levels of Competition Studied

The analysis of competition levels showed that the studies included in this work focused on semi-professional teams (adult football in lower leagues and competitive youth football), professional teams (top-division adult football), and amateur teams (recreational football across all age categories), as illustrated in Figure S3.

The results show greater research interest in semi-professional teams, which accounted for 55% of the studies. Professional teams represented 20%, and amateur teams 16%. Additionally, 9% of the sample involved mixed-level analyses, combining two or more competition levels within the same study.

As shown in Figure S4, the analysis by biological sex revealed a significant imbalance between studies focused on male and female football. From the reviewed studies, 52% focused solely on male football and only 6% on female football. Articles including both sexes comprised 42% of the sample, involving 6,054 male athletes and 3,297 female athletes, as well as 15 male and 5 female coaches.

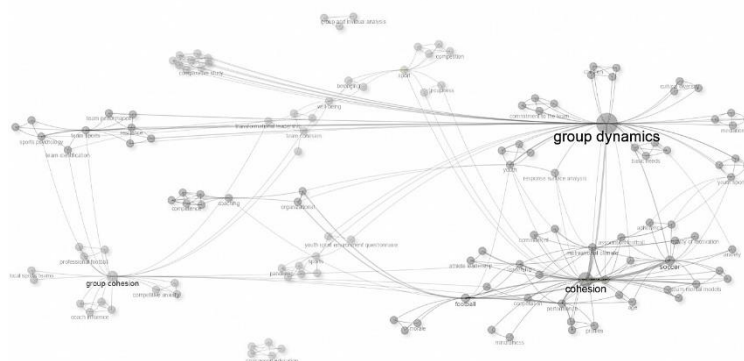
The analysis was also stratified by the age groups of the participants. Regarding age group distribution, four categories were created: 1) adult athletes (+17 years), 38% of the total; 2) youth athletes (12–16 years), 42%; 3) child athletes (6–11 years), 5%; and 4) mixed ages (studies including more than one age group), 15%, as shown in Figure S5.

From 24 studies on adult athletes, 9 focused on professionals, 12 on semi-professionals, and 3 on amateurs. Among studies involving professional clubs, most targeted teams in lower divisions of national leagues. In total, 51 articles focused exclusively on football, while 13 also included other team sports. These are depicted in Figure S6.

To deepen the understanding of the conceptual structure of the field, keyword co-occurrence network analysis is an effective tool, as it reveals how concepts are grouped and interconnected (Donthu et al.,

2021). For this stage, the Biblioshiny software (an interactive web-based interface for the Bibliometrix package) was used to generate graphical visualisations capable of identifying central concepts (hubs) and their articulation in the formation of thematic groups (clusters). Figure 4 shows a relatively fragmented network structure, yet marked by three main clusters that organise the research landscape. The size of the nodes, proportional to their frequency of occurrence, highlights three terms of greatest centrality - “group dynamics”, “cohesion”, and “group cohesion” - which act as structuring axes of the analysed literature. The strong interconnection among these related terms suggests that they constitute the fundamental theoretical basis of the area.

Figure 4. Keyword co-occurrence network related to group cohesion in football



Source: Author's own elaboration.

In the upper-right quadrant, the “Group Dynamics” cluster is organised around terms such as “sport”, “competition”, “children”, “cultural diversity”, and “well-being”, indicating a line of research oriented towards the broader sporting environment, with an emphasis on training, social inclusion, and the psychosocial aspects of youth and amateur sport. In the lower-right quadrant, the “Cohesion” cluster appears denser and more ramified, with a strongly applied character linked to high performance. Its associated terms - “performance”, “anxiety”, “leadership”, “motivational climate”, and “cooperation” - suggest cohesion as a fundamental mediating variable for tactical and psychological performance in team sports.

Finally, the “Group Cohesion” cluster, located on the left, connects to themes related to management and organisational psychology applied to sport, such as “coach influence”, “professional football”, and “local sports teams”. Its connection with the terms “transformational leadership” and “team performance” is also evident, indicating that leadership functions as a conceptual bridge between group cohesion and team performance. Analysis of the peripheral regions of the network reveals more specific or emerging topics of interest. The presence of terms such as “pandemic” (in the lower centre) indicates interest in the impacts of Covid-19, while small isolated subgroups - such as “concussion education” or “comparative study” - point to specialised niches which, although relevant, still show low integration with the central core of research on group cohesion.

By examining the topics, and in some cases, the introductions and methodological sections, it was possible to classify the studies based on their main theme (Group Cohesion) and other accompanying subjects, as illustrated in Figure S7.

Most of the articles addressed Group Cohesion (GC) in combination with other themes. Accordingly, the following thematic categories were established: 1) Group Cohesion (GC), accounting for 6.5% of the sample; 2) GC + Motivational Climate, 16%; 3) GC + Social Behaviour, 17%; 4) GC + Leadership, 9.5%; 5) GC + Performance, 17%; 6) GC + Task Cohesion, 3%; and 7) GC + Other Themes, 31%.

The “Other Themes” category includes studies that explore complementary topics not previously mentioned, or that address more than one theme from the already established categories. For example, a study analysing the triad Group Cohesion + Motivational Climate + Leadership could be classified under two categories. To avoid a duplicated classification, it was included in the “GC + Other Themes” category.

In order to ensure the reliability of this strategy, all the themes present in the 20 articles within this category were listed in Table S1 of the supplementary material, along with the number of occurrences of each.

Discussion

The organisation and visualisation of data facilitated the generation of new insights and analytical approaches in this study. Although not a central figure in the networks identified in this review, due to his work not focusing exclusively on football, Professor Albert Carron (Western University, Canada) remains one of the most influential researchers in the study of group cohesion in sport. Among his primary contributions are the development of the conceptual model and the creation of the Group Environment Questionnaire (GEQ), an instrument widely used to assess the level of group cohesion in adult teams across various sports (Carron et al., 1985).

Studies highlight the GEQ as the most reliable and widely used contemporary instrument for measuring group cohesion in sport, and its theoretical framework has underpinned the majority of studies conducted to date (Nascimento Junior et al., 2012). This observation is confirmed in the present review, wherein 87% of the selected articles cite Carron's work, and 68% of them employed the GEQ directly as a data collection instrument for their sample. Furthermore, the Youth Sport Environment Questionnaire (YSEQ), developed by Eys et al. (2009), was inspired by and grounded in Carron's creation, constituting an adaptation of the GEQ for research involving children and adolescents. Without doubt, the YSEQ has been an important instrument for understanding the behavioural aspects of youth athletes, as they tend to be more susceptible to negative attitudes such as lack of discipline in training, low respect for coaches and teammates, and antisport behaviours, including provocation and cheating during matches (Akbar et al., 2025).

The analysis of co-authorship networks within the selected articles indicates that the dissemination of instruments such as the GEQ and the YSEQ occurs through interaction among highly interconnected research groups, particularly in North America and Europe. These groups and their central authors thus act as nuclei of scientific legitimization, which appears to facilitate the spread of these questionnaires and other standardised methodological protocols. This characteristic clearly influences how group cohesion is conceptualised and measured in different football contexts and suggests that future studies and interventions in football may benefit from closer alignment with these groups, through the adoption of validated instruments consistent with the methodological designs and trends established in the literature.

It is important to explore key information that supports the construction of an overview of patterns concerning group cohesion in football. These data underscore the importance of research focused on young athletes during their formative years, a critical period for personality development and sociocultural integration within team environments (Côté & Vierimaa, 2014). It is pertinent to investigate whether the results from mixed-sport analyses are similar to those of related studies focusing exclusively on football, seeking to identify similarities and differences in how group cohesion is established and maintained in football compared to other sports.

The majority of studies linked group cohesion to other related or auxiliary themes, revealing the complex nature underlying analyses of human sociability within the realm of sport. It is feasible to observe that, in addition to the themes present in other categories, competitive anxiety, intention to return to sport, resilience, satisfaction of psychological needs, and intragroup conflict are themes mentioned more than once, indicating subjects with potential for further development in research involving group cohesion. The recurrence of these auxiliary themes points to possibilities for practical application. For example, the association between cohesion, resilience, and competitive anxiety offers a rich context of evidence for professionals in football coaching staff to develop integrated actions that promote the retention of athletes in youth categories, reducing dropout rates and minimising potential harmful emotional effects.

The findings demonstrate that research on group cohesion in football is grounded in fundamental psychological constructs, such as motivational climate, collective efficacy, and interpersonal dynamics. These elements are directly associated with athlete engagement, mental performance, and the emotional aspects of team functioning, all of which are central to contemporary sport psychology.



Although the bibliometric approach made it possible to identify macro-level patterns in scientific production, certain limitations must be acknowledged. First, the analysis was restricted to the Web of Science and Scopus databases, which may exclude relevant studies published in regional or non-indexed journals, particularly those from Latin American, African, or Asian contexts. This methodological choice also implies accepting the structural biases of these databases, which favour Global North journals, predominantly published in English, thereby reinforcing the English bias and reducing the epistemological diversity captured by the analysis. The absence of complementary databases such as SciELO (important for scientific output in Portuguese and Spanish-speaking countries), PubMed (relevant for psychophysiological studies) and Google Scholar (which incorporates grey literature and non-indexed work) may further limit the reach and representativeness of the findings. Furthermore, citation metrics, although useful for measuring academic impact, do not always reflect methodological quality, theoretical depth, or practical applicability, particularly in sport-specific contexts where cultural factors influence the understanding of phenomena such as group cohesion. Likewise, analyses of co-occurrence, co-authorship networks, and visualisations generated by software such as VOSviewer and Bibliometrix depend on technical choices (thresholds, clustering algorithms, data normalisation) that may produce variations in how thematic groupings are represented. These limitations suggest caution in generalising the results and reinforce the need to complement bibliometric analyses with thematic systematic reviews and qualitative interpretations that allow for a deeper understanding of how group cohesion has been investigated across different sporting contexts.

Conclusions

This scoping review with bibliometric support consolidated sport psychology research on group cohesion in football (soccer) by analysing the evolution of academic interest in the topic, which showed significant growth from 2010 onwards. However, it is important to highlight that a significant portion of the theme's conceptual foundation had already been developed, mainly through the research led by Albert V. Carron starting in the 1970s. Although he passed away in 2014, Carron remained highly influential within the specialist academic community, with most articles citing his work and directly employing the Group Environment Questionnaire (GEQ), as well as its adaptations for different age groups and languages. The 64 publications analysed confirmed that group cohesion was widely recognised as a key factor in sporting performance. However, other themes such as leadership, motivational climate, social dynamics, and performance were frequently and intrinsically intertwined with it.

Active authors and a broad, synergistic co-authorship network involving the United Kingdom, Australia, United States of America, Japan, Belgium, and India appeared to have consolidated the theme of group cohesion in football across various universities around the world. Notable institutions included the Universidad de Extremadura in Spain, the University of Saskatchewan and Wilfrid Laurier University in Canada, and Loughborough University in the United Kingdom. Although Brazil had a number of publications equivalent to those of the United Kingdom and the United States of America, it did not participate in the international co-authorship networks identified in this review.

Some journals began to specialise in publishing articles on this topic, notably *Psychology of Sport and Exercise* and the *Journal of Sports Sciences*, which may provide a relevant indicator for researchers embarking on their investigative journeys and seeking to publish their findings. Each of the 32 journals with only a single publication on the subject, although not indicative of a specialisation trend, still contributed to demonstrating the academic relevance of research on group cohesion in football. In total, 41 journals were identified that supported the dissemination of this theme in various parts of the world.

Despite advances in research in this area, four significant gaps were identified. The first concerned the scarcity of studies employing methodologies alternative to the exclusive use of questionnaires, or combining these tools with other approaches, as only two articles utilised interviews, which suggested a promising field for future investigations. Interviews enabled access to important accounts that deepened the subject, allowing for the collection of multiple pieces of information and viewpoints from interlocutors. According to Duarte (2004, p. 213), "[...] interviews are fundamental when it is necessary/desirable to map practices, beliefs, values, and classificatory systems of specific social universes, more or less well defined, in which conflicts and contradictions are not clearly explicit". This statement seemed to align well with the analytical framework of a theme as complex and multifaceted as group



cohesion. Furthermore, interviews could have overcome some known limitations of questionnaires, such as difficulties in understanding questions, response bias facilitated by the lack of communicative interaction with the interviewer, low response rates in many cases, limited depth of responses, memory retrieval issues, and accuracy of answers, among others (Fowler, 2013).

The second gap was related to the low involvement of other social actors who directly influenced group cohesion, which may have provided opportunities for new research analyses. According to Martín-Barbero et al. (2025), the direct involvement of the coach in the developmental process contributes to a more holistic understanding of athletes' performance in the competitive environment, which, in turn, influences how group cohesion is structured. From the articles analysed, only 7.8% included coaches in their samples, revealing that analyses of group cohesion and related topics were predominantly derived solely from the perceptions and opinions of the athletes.

The third gap concerned the scarcity of research focusing exclusively on group cohesion in women's football, which accounted for only 6% of the sample in this review. From the four articles identified, none investigated professional women's football. Even among studies that included both sexes, 64% had a larger male sample than female, with female participation corresponding to 35% of the total 9,371 participants. The emphasis on male participants may have introduced a bias in understanding the focus of these studies if investigations were not also conducted in isolation and comparatively.

The fourth gap was related to the low incidence of investigations in professional clubs from top divisions and major leagues, which may have indicated resistance from these clubs to accept scientific research within their training and competition environments.

The findings reaffirmed group cohesion as a determinant factor for football players' performance and wellbeing. To translate these insights into practice, clubs could have implemented standardised protocols, such as periodic administration of the Group Environment Questionnaire (GEQ), adapted for different categories (youth/professional) and competitive contexts (pre-season, tournaments). Furthermore, the identified academic networks (e.g., Spain-Canada) revealed opportunities for university-club partnerships targeting evidence-based interventions, particularly in shared leadership programmes and motivational climate adjustments.

For researchers, these results emphasised the need for greater engagement with sports organisations, while managers and coaches should have established formal dialogue channels with academia. Future studies should investigate how such collaborations functioned in underrepresented cultural contexts (e.g., South America, Asia). Collectively, these measures could have optimised team performance and consolidated sport psychology's role as a bridge between research and practical application. Finally, although the topic is widely studied within the field of psychology, as confirmed by the sample analysed here, the multifactorial nature of group cohesion creates opportunities for other fields, such as anthropology and sociology, to make further contributions.

Acknowledgements

We thank our colleagues from the working group of the graduate program in Physical Education of the Paraná Federal University (AGON) for valuable suggestions on this work.

Financing

This study was financed in part by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brasil (CAPES) – Finance Code 001.



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