ORIGINAL RESEARCH ORİJİNAL ARAŞTIRMA

DOI: 10.5336/sportsci.2025-114992

Scientific Trends in Physical and Physiological Performance Research on Female Football Players (2001-2025): Bibliometric Study

Kadın Futbolculara Yönelik Fiziksel ve Fizyolojik Performans Araştırmalarında Bilimsel Eğilimler (2001-2025): Bibliyometrik Çalışma

Ömer AKSOY[a]

[a]İstanbul Gelişim University Faculty of Sports Sciences, Department of Coaching Education, Department of Movement and Training Sciences, İstanbul, Türkiye

ABSTRACT Objective: This study aimed to analyze the prominent trends in scientific research on the physical and physiological performance of female football players between 2001 and 2025 using bibliometric methods. **Material and Methods:** A total of 599 articles obtained from the Web of Science Core Collection database were limited to publications written in English and classified as "articles". VOSviewer software was used for data analysis, while Microsoft Excel was used to visualize the graphical outputs. **Results:** The number of publications showed a significant increase over the years, with a notable acceleration particularly after 2020. The United States, Spain, Brazil, and Canada were among the most productive countries, while Clemente FM, Nobari H, and Bishop C emerged as the most prolific researchers. Keyword clustering revealed a concentration on current performance parameters such as "training load", "injury prevention", and "aerobic capacity". Overlay analysis showed that these themes have become more prominent in recent years. Collaboration networks among authors, institutions, and countries indicated that scientific development in women's football has gained an international and interdisciplinary character. The bibliographic coupling map revealed that journals such as the *Journal of Strength and Conditioning Research* played a central role in the field. **Conclusion:** This study maps the thematic structure of performance-focused scientific publications in women's football and provides a guiding framework for future research.

Keywords: Women's football; physical performance; physiological parameters; bibliometric analysis

ÖZET Amaç: Bu çalışmada, 2001-2025 yılları arasında kadın futbolcuların fiziksel ve fizyolojik performansına yönelik bilimsel araştırmalarda öne çıkan eğilimlerin bibliyometrik yöntemle analiz edilmesi amaçlanmıştır. **Gereç ve Yöntemler:** Web of Science Core Collection veri tabanından elde edilen 599 makale, İngilizce dilinde yayımlanmış ve "article" türündeki yayınlarla sınırlandırılmıştır. Verilerin analizinde VOSviewer yazılımı, grafiksel çıktıların görselleştirilmesinde ise Microsoft Excel programı kullanılmıştır. **Bulgular:** Yayın sayılarının yıllara göre anlamlı bir artış gösterdiği, özellikle 2020 sonrasında dikkate değer bir ivme kazandığı belirlenmiştir. Amerika Birleşik Devletleri, İspanya, Brezilya ve Kanada en fazla yayın yapan ülkeler arasında yer alırken; Clemente FM, Nobari H ve Bishop C en üretken araştırmacılar olarak öne çıkmıştır. Anahtar kelime kümelenmeleri, "training load", "injury prevention" ve "aerobic capacity" gibi güncel performans parametreleri üzerinde yoğunlaşmıştır. Overlay analizinde bu temaların son yıllarda daha belirgin hâle geldiği görülmüştür. Yazarlar, kurumlar ve ülkeler arası iş birliği ağları, kadın futboluna yönelik bilimsel gelişimin uluslararası ve disiplinler arası bir nitelik kazandığını göstermiştir. Bibliyografik bağlantı haritası ise *Journal of Strength and Conditioning Research* gibi dergilerin alanda merkezi bir rol oynadığını ortaya koymuştur. **Sonuç:** Bu çalışma, kadın futbolu özelinde performans odaklı bilimsel yayınların tematik yapısını haritalandırarak gelecekteki araştırmalar için yönlendirici bir çerçeve sunmaktadır.

Anahtar Kelimeler: Kadın futbolu; fiziksel performans; fizyolojik parametreler; bibliyometrik analiz

TO CITE THIS ARTICLE:
Aksoy Ö. Scientific trends in physical and physiological performance research on female football players (2001-2025): Bibliometric study. Turkiye Klinikleri J Sports Sci. 2026;18(2):259-69.

Correspondence: Ömer AKSOY
İstanbul Gelişim University Faculty of Sports Sciences, Department of Coaching Education, Department of Movement and Training Sciences, İstanbul, Türkiye
E-mail: aksoyyomerr@gmail.com

Peer review under responsibility of Turkiye Klinikleri Journal of Sports Sciences.

Received: 23 Sep 2025 ***Received in revised form:*** 22 Oct 2025 ***Accepted:*** 01 Nov 2025 ***Available online:*** 22 Jun 2026

2146-8885 / Copyright © 2026 by Türkiye Klinikleri. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

Although the Fédération Internationale de Football Association (FIFA) has long emphasized the humanistic values of football and its potential to generate social benefit, it has more recently demonstrated a unique commitment among global sports governing bodies to respecting human rights and promoting gender equality through concrete actions.[1]

In this context, FIFA has taken significant steps by developing a dedicated strategy for women's football that aims to protect the rights of female athletes, monitor and analyze the development of women's football, and highlight fundamental concepts such as gender equality and women's empowerment in sports.[2] These advancements underscore not only the growing numerical participation of women in football but also the critical importance of scientifically understanding their physical and physiological performance.

While the physiological responses to training in female football players occur through mechanisms similar to those observed in their male counterparts, differences in performance levels are primarily attributed to biological and structural distinctions such as body composition, energy system utilization, muscle mass, and strength levels.[3]

In recent years, there has been a significant increase in the number of competitions in which elite-level female footballers participate, both nationally and internationally.[4] Correspondingly, the total distance covered during matches has also increased. For instance, the average distance covered per match, which was approximately 8.5 kilometers in 1990, had risen to 10.3 kilometers by 2005.[4] Based on this context, it becomes evident that in order for female football players to gain a competitive edge over their opponents, it is not sufficient to focus solely on attributes such as speed and strength; the development of endurance capacity is also essential.[5]

One study reported that elite female footballers exhibit average oxygen consumption levels of 77-80% of their VO_2max during matches, with peak values reaching up to 96%.[6] These findings indicate that female players exert effort close to their maximum capacity during matches and heavily rely on the aerobic energy system. The evaluation of various studies suggests that the physiological and physical performance parameters of female football players require more thorough scientific investigation. Although recent years have seen a sharp increase in research focusing on female football players.[7] It is emphasized that bibliometric studies specifically examining their physical and physiological performance remain limited.[8]

This study provides a bibliometric analysis of research on the physical and physiological performance of women's football players (2001-2025), mapping publication trends, detailing keyword-based thematic structures, identifying research gaps, and describing international collaboration patterns. The secondary aim is to map the position of women's football in the scientific domain based on the findings and to visualize the existing body of knowledge in order to provide guiding insights for future research in this field.

MATERIAL AND METHODS

RESEARCH DESIGN

This study was conducted using a bibliometric scanning model aiming to analyze the prominent scientific trends in research on the physical and physiological performance of female football players. Bibliometric analysis is a systematic method that enables the quantitative evaluation of academic publications, researchers, institutions, and the impact of scientific output within a specific field.[9] Such analyses offer key metrics that are frequently employed by individuals and institutions to assess research performance.[10]

Moreover, bibliometric methods are widely used to monitor shifts in scientific paradigms over time, examine interdisciplinary transitions, and identify highly influential studies and researchers.[11] In addition, the review process of the selected studies was designed to align with the cognitive framework of Bloom's Taxonomy. Bloom's Taxonomy is a hierarchical model that classifies cognitive learning processes into 6 levels knowledge, comprehension, application, analysis, synthesis, and evaluation explaining how academic content is processed mentally.[12] Since this study is based solely on bibliometric datasets and does not involve any human participants, ethical approval was not required.

ETHICAL APPROVAL AND INSTITUTIONAL PERMISSION

This study was conducted exclusively on publicly available bibliometric data and does not involve human participants, animal experiments, or any personally identifiable information. Therefore, ethics committee/institutional review board approval was not required.

DATA ANALYSIS

The bibliometric data for this study were obtained from the Web of Science Core Collection database (Clarivate Analytics, Philadelphia, PA, USA). The advanced search function was used, targeting the topic field (TS), with the following keyword combinations:

TS=[("women footballer" OR "female football player" OR "female soccer player" OR "women soccer") AND (physiology OR "physical performance" OR fitness OR "physical activity" OR endurance OR strength OR speed OR agility OR power OR VO_2max OR "anaerobic threshold" OR "aerobic capacity" OR flexibility)].

As a result of this search, a total of 845 records were initially identified. The following inclusion and exclusion criteria were applied during the filtering process (Figure 1).

Only articles written in English,

Publication years limited to 2001-2025,

Inclusion of studies indexed in the Science Citation Index Expanded and Social Sciences Citation Inde,

Exclusion of articles indexed in the Emerging Sources Citation Index,

Following this filtering process, a total of 599 articles were included in the final analysis.

DATA ANALYSIS AND VISUALIZATION PROCESS

The bibliometric analyses of the 599 articles obtained after the filtering process were conducted using VOSviewer software (version 1.6.20; Centre for Science and Technology Studies, Leiden University, Leiden, the Netherlands). The visualizations of the graphical outputs derived from the analysis were created using Microsoft Excel (Microsoft Corporation, Redmond, WA, USA). The bibliometric maps presented in Figure 2, Figure 3, Figure 4, Figure 5, Figure 6, Figure 7, Figure 8, Figure 9, Figure 10 were generated using VOSviewer and are based on the modularity-based clustering algorithm developed by van Eck and Waltman. In these maps, each color represents a cluster of items with similar characteristics.[13] The colors are used solely for visual distinction between clusters and do not imply any order or level of importance. Nodes in the maps represent items such as keywords, authors, institutions, countries, or journals. The size of a node reflects the number of publications or frequency of occurrence associated with that item. The lines connecting the nodes indicate relationships (e.g., co-authorship, co-occurrence), and the thickness of the lines corresponds to the strength of those relationships.

Sources are positioned closer together, indicating thematic or disciplinary proximity.

RESULTS

Figure 2 illustrates the annual distribution of publications on female football players indexed in the Web of Science database between 2001 and 2025.

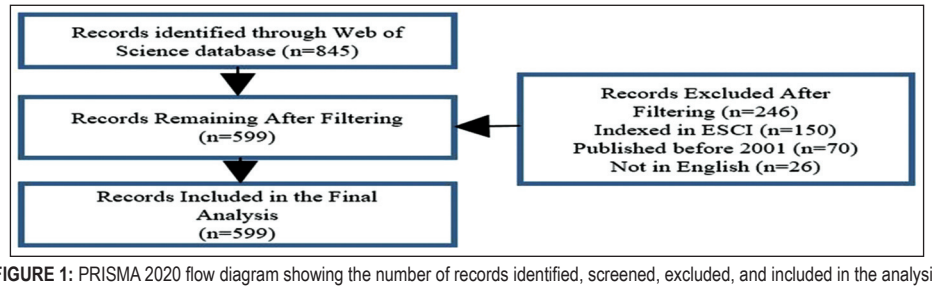

FIGURE 1: PRISMA 2020 flow diagram showing the number of records identified, screened, excluded, and included in the analysis
ESCI: Emerging Sources Citation Index

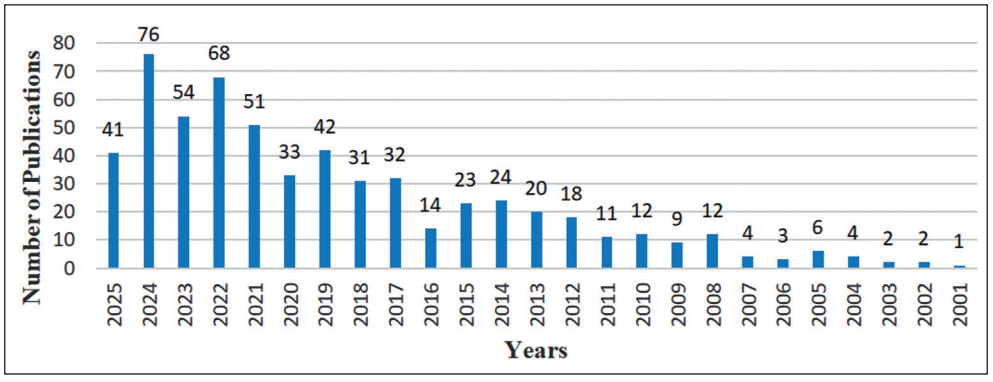

FIGURE 2: Annual number of publications on female football players

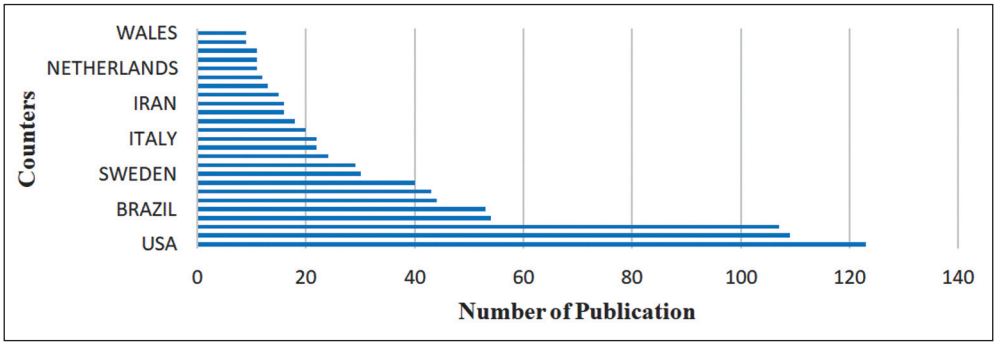

FIGURE 3: Distribution of publications by country

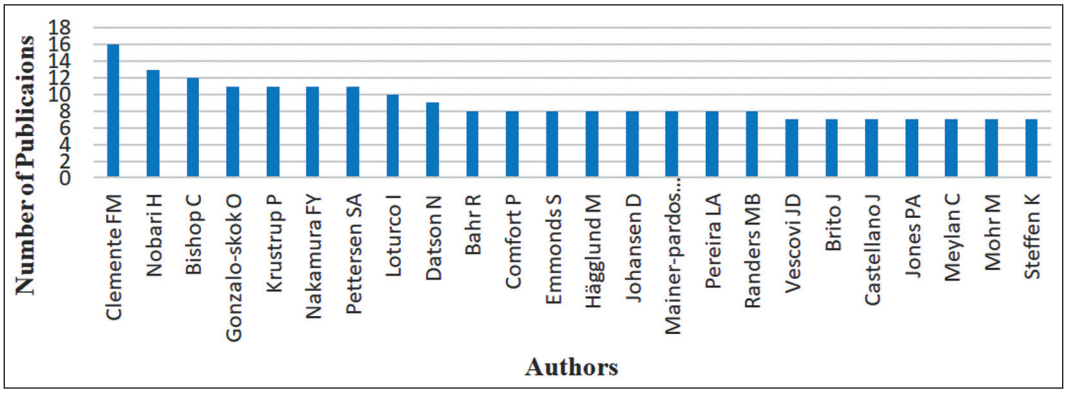

FIGURE 4: Authors with the highest number of publications on female football players

Figure 3 illustrates the distribution of publications related to female football players by country between 2001 and 2025.

Figure 4 illustrates the most prolific authors who have contributed to scientific publications on female football players between 2001 and 2025. The chart is based on data retrieved from the Web of Science database.

Figure 5 presents the co-occurrence relationships among keywords that appeared at least 7 times in scientific publications on female football players between 2001 and 2025.

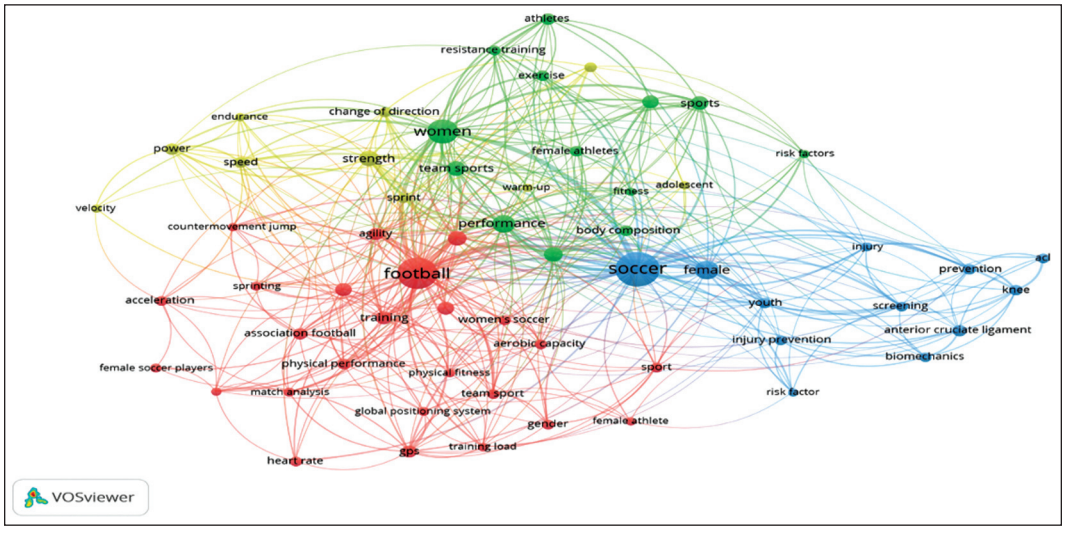

FIGURE 5: Keyword clustering map of publications on female football players

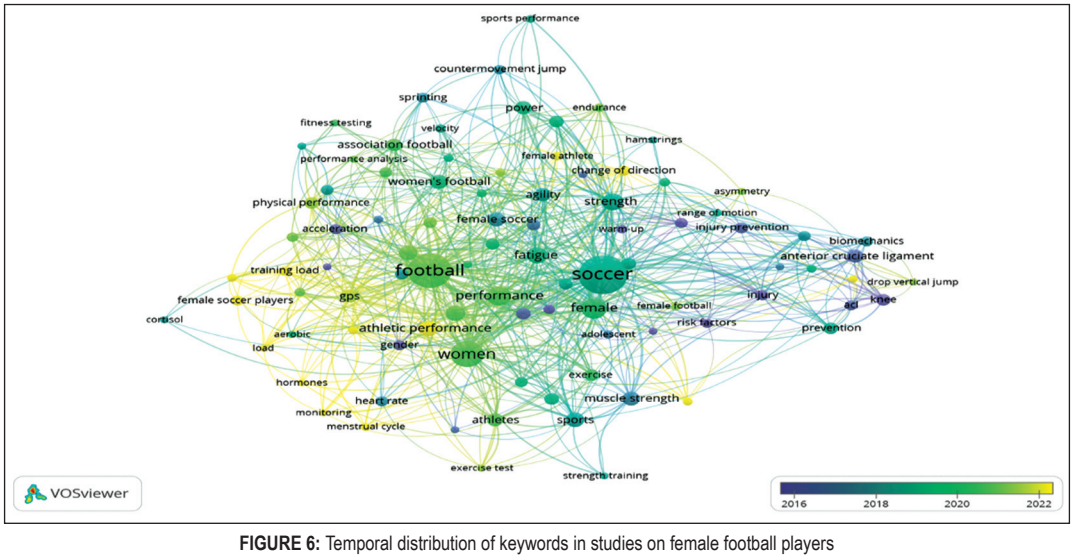

FIGURE 6: Temporal distribution of keywords in studies on female football players

Figure 6 illustrates the temporal distribution of keywords that appeared at least 5 times in scientific publications on female football players between 2001 and 2025, highlighting their frequency of use over the years.

Figure 7 illustrates the collaboration network among authors who contributed to scientific publications on female football players. In this map, generated using VOSviewer software, each node represents an author, while the lines between nodes indicate co-authorship relationships.

Figure 8 illustrates the collaboration relationships among institutions involved in scientific publications on female football players. In this map, generated using VOSviewer software, each node represents an institution, and the lines indicate collaborative links based on co-authored publications. The colored clusters represent groups of institutions with strong interactions within the same collaboration network.

Figure 9 displays the international collaboration network in scientific research on female football

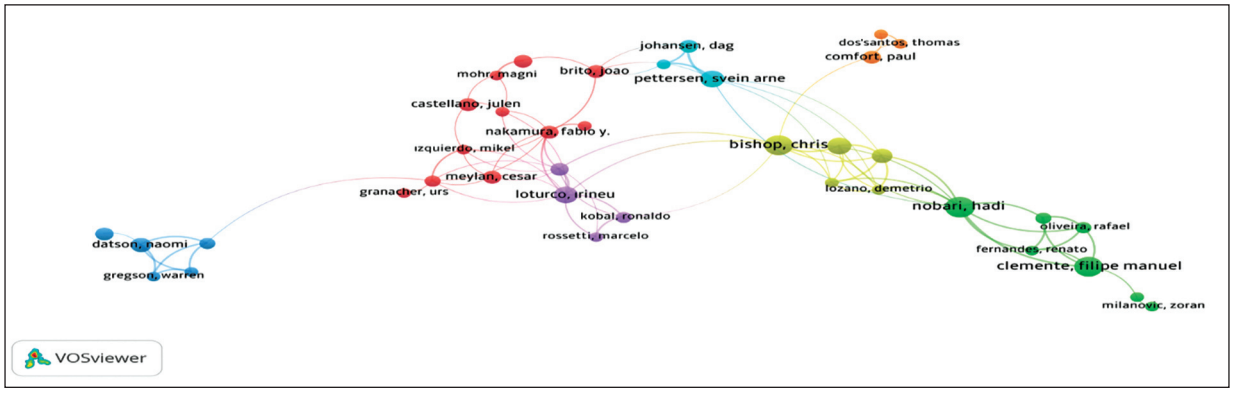

FIGURE 7: Author collaboration map based on publications on female football players

FIGURE 8: Institutional collaboration network map in scientific publications on female football players

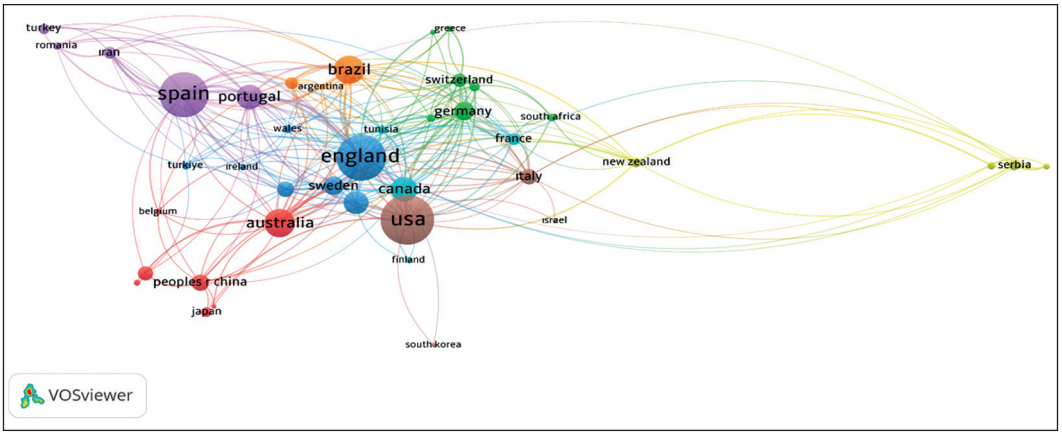

FIGURE 9: International collaboration map in scientific publications on female football players

players. Each node in the map represents a country, and the size of the node corresponds to the total number of publications associated with that country. The lines between nodes indicate co-authored publications and collaborative relationships between countries. Countries grouped with the same color represent clusters that are closely connected and share similar research focuses.

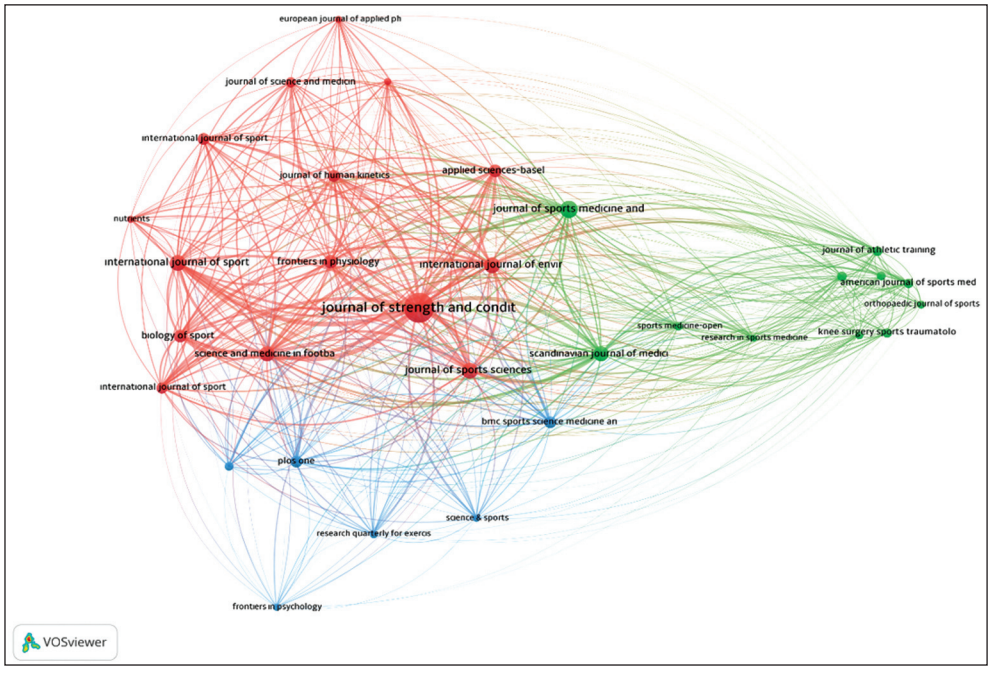

FIGURE 10: Bibliographic coupling map of journals publishing scientific studies on the physical and physiological performance of female football players

Figure 10 illustrates the bibliographic coupling relationships among journals that have published scientific studies on the physical and physiological performance of female football players. In this visualization generated using VOSviewer software, each node represents a journal, and the size of the node reflects the total number of citations received by articles published in that journal. The connecting lines between journals indicate the strength of their shared references. Journals grouped in the same color represent clusters with similar subject areas or research focuses.

DISCUSSION

In this study, the scientific development of research on the physical and physiological performance of female football players between 2001 and 2025 was examined through bibliometric analysis. The data analyzed in this study were retrieved from the Web of Science database and limited to articles published in English (Figure 1). The findings indicate a growing research interest in this field over time, with a notable increase in the number of publications in recent years. Additionally, the results highlight that certain countries have emerged as leading contributors to the scientific literature on this topic.

In this context, as shown in Figure 2, the increase in the number of publications between 2001 and 2025 gained significant momentum, particularly after 2020, reaching its peak in 2024. In a bibliometric analysis, it was noted that research on female football began to increase after 2010, with a marked acceleration in the *last* 4 years, which was associated with the professionalization of the sport. Similarly, highlighted a rise in research on women's football after 2019.[7,8] However, their study primarily focused on general themes such as sociology, media, and injury-related issues. In this regard, the current study complements their broader analysis by providing a more specific and detailed contribution focused on performance-related parameters.

When examining Figure 3, it becomes evident that the majority of academic publications in the field of women's football originated from the United States, followed by Spain, Brazil, and Canada. This pattern is considered to reflect the level of institutional and structural support these countries provide for women's football. The widespread popularity of

women's football in the United States is evident not only through the existence of a well-established professional league but also through its strong academic research output. Similarly, Canada stands out for having hosted the FIFA Women's World Cup in 2015 and for actively supporting research in this domain. The emergence of Brazil and Spain as prominent contributors is likely linked to the recent development of professional leagues in these countries and the increasing support from their football federations. Consistent with these findings, a bibliometric study of the literature reported that the United States held a position comparable to that observed in our study, followed by the United Kingdom and Spain.[8] Additionally, the results of another bibliometric analysis corroborate these findings, identifying the United States, the United Kingdom, and Spain as the most productive countries in terms of publication output.[7] In this context, the results of the present study are consistent with the existing literature and further emphasize the correlation between national support for women's football and academic publication output.

Evidence indicates that increases in country-level publication counts on women's football, without ascribing causality, are temporally contemporaneous with elite level competitive outcomes in some contexts. Notably, the United States has maintained a position at the summit of the FIFA Women's World Ranking and secured gold at the Paris 2024 Olympic Games.[14] Spain's recent rise coincides with its 2023 FIFA Women's World Cup title and a return to No.1 in the world ranking in August 2025.[15,16]

An examination of the most productive authors in Figure 4 indicates that Clemente FM emerges as the most prolific researcher, followed by Nobari H, Bishop C, Gonzalo-Skok O, Krustrup P, Nakamura FY, and Pettersen SA. Upon reviewing the literature, a review article on linear and multidirectional speed tests in female football players has been published, in which Clemente's contributions are particularly prominent.[17] In other studies involving female football players, authors such as Nobari, Bishop, Gonzalo-Skok, and Pettersen have been reported to make substantial contributions to the field.[18] In a separate investigation, it was noted that collaborative efforts involving authors such as Nobari and Pettersen have helped spearhead and advance research in women's football.[19] These findings are consistent with the results of the current study, confirming the prominent role of these authors in shaping the academic literature on female football.

An examination of the keyword co-occurrence map in Figure 5 reveals the relationships among keywords that appeared at least 7 times in studies on female football players, presented through color-coded thematic clusters. Upon reviewing the literature, one study reported that terms such as "football", "female soccer", "performance", "training", and "injury prevention" were identified as core themes, whereas in smaller clusters, terms such as "heart rate", "sprint", "strength", and "recovery" emerged as prominent.[8] In another bibliometric study, the themes were delineated into 3 major clusters for example, physical performance, nutrition, coaching strategies, and tactical analysis. Using these keywords, the overall bibliometric map shows that concepts pertaining to women's football recede into the background, while performance analysis and tactical topics come to the fore.[20] However, in these broader bibliometric mappings, concepts directly related to female football players often remained in the background, with more emphasis placed on general performance and tactical topics. In contrast, the present study focuses exclusively on publications concerning female football players, setting it apart from general football literature. The prominence of terms such as "female", "women", "training load", and "injury prevention" at the center of our map demonstrates the specificity and clarity of the research focus on women's football. Therefore, the thematic structure of our keyword map strongly suggests that the present study successfully reflects the unique conceptual landscape of the literature on female football.

The temporal trend of keywords presented in Figure 6 reveals how research topics related to female football players have evolved over time. In the overlay visualization, blue tones represent topics that were more prominent in earlier years, such as injury prevention and strength, while yellow tones indicate more recent focal points, including training load, Global Positioning System (GPS), hormones, and

aerobic capacity. This shift suggests that contemporary research on women's football has increasingly focused on more specific performance-related domains, such as physiological monitoring, training load tracking, and individualized performance analysis. Supporting this trend, recent studies by Bishop and Clemente have highlighted the growing emphasis on GPS-based tracking, training load monitoring, and the impact of hormonal cycles on performance in female football players. These developments underscore a move toward more targeted and individualized approaches in the performance analysis of female athletes.

An examination of Figure 7 reveals that authors such as Bishop, Nobari, Clemente, and Loturco I have established strong collaborations with various research groups, forming highly productive clusters of co-authorship. These individuals not only contribute substantially through their own publication output as previously highlighted in Figure 3 but also appear to play a leading role in shaping the scientific development of the field. The colored clusters in the collaboration map typically represent authors affiliated with the same country or research group. Notably, scholars like Bishop and Clemente act as bridging figures, connecting otherwise separate research clusters, thus underscoring their integrative and influential roles in the academic network surrounding female football research.

The institutional collaboration map presented in Figure 8 indicates that universities such as the University of Extremadura**,** Norwegian School of Sport Sciences**,** University of Porto, and University of Salford occupy central positions in the research network on female football. These institutions have established collaborative links with a wide range of other universities and research centers. This finding suggests that these institutions are not only productive in terms of publication output but also serve as influential hubs that guide the scientific direction of research in this field. As previously noted, prior studies have emphasized that institutions by virtue of their high publication output and collaborations with other countries have played a pivotal role in the advancement of research on women's football.[7,8]

An analysis of Figure 9 reveals that countries such as the United Kingdom, the United States, Spain, and Australia stand out in terms of their network centrality. These countries contribute not only through their individual research productivity but also by establishing collaborative ties with a wide range of research institutions across different regions. Such extensive international collaboration positions them as key actors in shaping the academic development of women's football. The colored clusters in the map represent the closeness of scientific interactions, and the frequent links observed between countries suggest that women's football is a globally relevant and interdisciplinary area of research interest.

Figure 10 displays the bibliographic coupling relationships among journals that have published scientific studies on female football players. This visualization, generated using VOSviewer software, highlights the extent to which journals cite common references, offering insights into the distribution and interaction of publication output across different journals in the field.[13]

In the visualization, each node represents a specific academic journal, and the size of the node reflects the total citation volume received by articles published in that journal. The connecting lines indicate shared references between journals, where a higher density of connections suggests greater citation overlap or reliance on similar bodies of literature.[21] Clusters shown in the same color represent thematic or methodological similarities between groups of journals.[22] The nodes representing journals such as the Journal of Strength and Conditioning Research and the Journal of Sports Sciences indicate that these outlets occupy a central position in terms of both the number of publications and citation impact related to studies on female football players. This suggests that these journals not only publish frequently on the topic but also function as foundational sources that shape and guide the academic discourse in this field.

Journals clustered in the red group primarily emphasize applied sport sciences, conditioning, and performance-based research, while those in the green cluster are more focused on orthopedic, medical, clin-

ical sports medicine, and rehabilitation-related studies.[13] The blue cluster, on the other hand, includes journals with a focus on sport psychology and motor skills. This disciplinary differentiation suggests that research on the physical and physiological performance of female football players exhibits a strong interdisciplinary character.[13-23] Based on these findings, it can be inferred that the journals occupying central positions in the map serve as leading platforms in their respective domains. As such, they can offer valuable guidance for researchers in terms of journal selection and thematic alignment when conducting literature reviews or planning future studies.

CONCLUSION

In conclusion, this study conducted a bibliometric analysis of the scientific literature on the physical and physiological performance of female football players between 2001 and 2025. The study identified key publication trends, thematic clusters, and patterns of international collaboration. The findings indicate a growing volume of performance-related research, with certain countries and institutions occupying central roles in publication output. Moreover, the emergence of female-specific conceptual themes highlights the increasing depth and specialization of the field.

In particular, the rising prominence of keywords such as training load, injury prevention, and aerobic capacity over time suggests the evolution of more interdisciplinary approaches. Accordingly, the present study not only maps the current state of the literature but also provides a roadmap for guiding future research efforts in the domain of women's football performance.

RECOMMENDATIONS

Future studies should incorporate more comparative analyses focused on the physiological variables of female football players. Additionally, researchers are encouraged to explore emerging themes identified in bibliometric trends, such as training load monitoring, GPS tracking, and hormonal fluctuations, to deepen the understanding of performance dynamics in women's football.

Future work should test potential associations between country-level publication output and on-field performance indicators (e.g., FIFA points/ranking, win ratio, Elo rating) using ecological correlation and multivariable models.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

This study is entirely author's own work and no other author contribution.

REFERENCES

1. Walzak L, Recupero J. Sport Media Vectors: Digitization, Expanding Audiences, and the Globalization of Live Sport. 1st ed. Champaign (IL): Common Ground Research Networks; 2021. [Crossref] [PubMed]
2. Krech M. Towards equal rights in the global game? FIFA's strategy for women's football as a tightly bounded institutional innovation. 2020;25(1):12-26. [Crossref]
3. Demirel H, Güner R, Turnagöl H, Başoğlu S, Zergeroğlu AM, Ülkar B, et al. Egzersiz Fizyolojisi. 6. Baskı. Ankara: Nobel Akademik Yayıncılık; 2011.
4. Mohr M, Krustrup P, Andersson H, Kirkendal D, Bangsbo J. Match activities of elite women soccer players at different performance levels. J Strength Cond Res. 2008;22(2):341-9. [Crossref] [PubMed]
5. Hasegawa N, Kuzuhara K. Physical characteristics of collegiate women's football players. Football Science. 2015;12:51-7. [Link]
6. Datson N, Hulton A, Andersson H, Lewis T, Weston M, Drust B, et al. Applied physiology of female soccer: an update. Sports Med. 2014;44(9):1225-40. Erratum in: Sports Med. 2014;44(9):1321. [Crossref] [PubMed]
7. Ventaja-Cruz J, Cuevas Rincón JM, Tejada-Medina V, Martín-Moya R. A bibliometric study on the evolution of women's football and determinants behind its growth over the last 30 years. Sports (Basel). 2024;12(12):333. [Crossref] [PubMed] [PMC]
8. Cherappurath N, Shamshadali P, Elayaraja M, KI DAK. Mapping the field: a bibliometric analysis of women's football research trends and future directions. Apunts Sports Medicine. 2024;59(223):100448. [Crossref]
9. Sillet A. Définition et usage de la bibliométrie dans la recherche [Definition and use of bibliometrics in research]. Soins. 2013;(781):29-30. French. [PubMed]
10. Durieux V, Gevenois PA. Bibliometric indicators: quality measurements of scientific publication. Radiology. 2010;255(2):342-51. [Crossref] [PubMed]
11. Ikpaahindi L. An overview of bibliometrics: its measurements, laws and their applications. Libri. 1985;35(2):163-77. [Link]
12. Bloom BS, Engelhart MD, Furst EJ, Hill WH, Krathwohl DR. Taxonomy of Educational Objectives: The Classification of Educational Goals. Handbook I: Cognitive Domain. 1st ed. New York: David McKay Company; 1956.
13. van Eck NJ, Waltman L. Visualizing bibliometric networks. In: Ding Y, Rousseau R, Wolfram D, eds. Measuring Scholarly Impact: Methods and Practice. Cham: Springer International Publishing; 2014. p.285-20. [Crossref] [PubMed]
14. Olympics.com [Internet]. (2024). © 2026 [Cited: October 22, 2025]. Football-women: results (Paris 2024). Available from: [Link]
15. FIFA Women's World Cup 2023TM [Internet]. Copyright © 1994 - 2026 FIFA [Cited: October 22, 2025]. Slick Spain beat England to win world crown. Available from: [Link]
16. FIFA [Internet]. Copyright © 1994 - 2026 FIFA [Cited: October 22, 2025]. Spain back on top of women's world ranking. Available from: [Link]
17. Beato M, Datson N, Clemente FM, Harper DJ, Filter A, Emmonds S, et al. Linear and multidirectional speed testing (on-field and off-field) protocols in senior and elite female football. J Strength Cond Res. 2025;39(1):e70-e84. [Crossref] [PubMed]
18. Pardos-Mainer E, Bishop C, Gonzalo-Skok O, Nobari H, Pérez-Gómez J, Lozano D. Associations between inter-limb asymmetries in jump and change of direction speed tests and physical performance in adolescent female soccer players. Int J Environ Res Public Health. 2021;18(7):3474. [Crossref] [PubMed] [PMC]
19. Roso-Moliner A, Mainer-Pardos E, Cartón-Llorente A, Nobari H, Pettersen SA, Lozano D. Effects of a neuromuscular training program on physical performance and asymmetries in female soccer. Front Physiol. 2023;14:1171636. [PubMed] [PMC]
20. Plakias S. Review articles on soccer performance analysis: a bibliometric analysis of current trends and emerging themes. Sports (Basel). 2025;13(5):131. [Crossref] [PubMed] [PMC]
21. Groos OV, Pritchard A. Documentation notes. Journal of Documentation. 1969;25(4):344-9. [Crossref]
22. Wouters P. The citation: from culture to infrastructure. In: Cronin B, Sugimoto CR, eds. Beyond Bibliometrics: Harnessing Multidimensional Indicators of Scholarly Impact. 1st ed. Cambridge (MA): MIT Press; 2014. p.47-66.
23. Boyack KW, Klavans R. Co‐citation analysis, bibliographic coupling, and direct citation: which citation approach represents the research front most accurately?. Journal of the American Society for information Science and Technology. 2010;61(12):2389-404. [Crossref]