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Global Research Trends and Future Opportunities in Cultural-Heritage Sports Tourism: A Bibliometric and Science-Mapping Analysis

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KEYWORDS

*Cultural Heritage,
Sport Tourism,
Historical Tourism Sport,
Health Effect,
Economic Effect,
Sustainable Development.*

ABSTRACT

Background. Sports tourism is widely developed around the world due to its potential health and economic benefits. To develop sustainable sports tourism, a review of previous research on the topic is necessary. **Objectives.** This study aims to determine research trends related to cultural heritage tourism sports. **Methods.** This study employed a literature review approach, combining bibliometric analysis and systematic review. Harzing Publish or Perish and Mendeley Desktop were used to search and sort data sources based on the Scopus and PubMed databases. Two main keywords were "Culture-heritage tourism sport" and "historical tourism sport" with a set period of 2016-2025. Database restrictions, document type, and English language were used in this study. A total of 101 selected articles saved in CSV format were then analyzed using VosViewers on May 9, 2025. The analysis included co-authorship analysis (unit: author and country), citation analysis, and co-occurrence analysis. **Result.** The results of this study present a bibliometric analysis and systematic review that present the main themes in the development of cultural heritage tourism sports. **Conclusion.** The findings of this study provide an overview of various forms of cultural heritage sport tourism activities spread throughout the world. Some activities that have been implemented provide benefits for tourists and have a positive impact on the social and economic conditions of local communities. The findings of this study also provide opportunities for future researchers to develop sustainable cultural heritage tourism sports by focusing on the preservation of cultural heritage itself.

INTRODUCTION

Sports have become the primary driver of demand for many countries worldwide, ultimately giving rise to the phenomenon of sports tourism (1). Sports tourism is an activity that combines sports and tourism into a single, integrated experience. Sports tourism activities can be carried out in the presence of people, places, and activities, where the activities are packaged in a way that prioritizes tourism as the primary goal and sports as the secondary goal, or vice versa (2). Sports

tourism has gained popularity due to its benefits for both physical and psychological health across all groups (3). Physical activities presented in sports tourism are designed to support the health of children and youth (4). Sport Tourism is not only for children and youth, but various forms of outdoor activities in tourism are also beginning to be developed for the elderly (5).

Recreational running, whether on city streets (city run) or in the mountains (trail run), is one of

the most widely practiced physical activities worldwide (6). Such activities provide benefits for the social and economic conditions of the surrounding community. The example of managing geological heritage in the Alps and Apennine mountains, as well as on the island of Sardinia, through laboratories and outdoor recreational activities, provides social and economic benefits to local communities (7). Equally intriguing, ancient sports also play a significant role in promoting tourism. For instance, in recent decades, ancient Iranian sports, particularly the Pahlevani and Zoorkhanei rituals, have emerged as creative cultural products, attracting many tourists to destinations and gaining fame as tourist attractions in Iran (8). The Thai long-boat race, another cultural heritage sport, also holds its appeal for tourists as an educational and cultural heritage tourism tool (9).

Outdoor activities, ranging from small-scale to large-scale sporting events, are also held. Small-scale sporting events and cultural heritage sporting events provide significant benefits for the sustainable development of tourist destinations (10). Through videos of mega events (Asian Games) posted on social media, the host country can promote its cultural diversity, tourism, and unique national aspects to participants and spectators from around the world (11). However, the increasing popularity of outdoor sports tourism activities has posed certain threats to the natural environment and cultural heritage. In recent years, incidents of outdoor sports enthusiasts damaging ecological environments and historical sites have become increasingly common (12). In addition to environmental sustainability issues, safety concerns related to sports tourism activities have gradually come under scrutiny. Therefore, organizers must provide a safety system that ensures the safety of visiting tourists (13).

As explained above, it is evident that sports tourism is growing, with various types of tour packages being offered to the public. These include nature-based sports tourism, cultural heritage sports tourism, the history of sports development in a country, cultural heritage sports, and the organization of small and mega-events. All forms of sports tourism offer numerous benefits for both tourists and organizers. All forms of sports tourism offered provide many benefits for tourists and tourism managers in a country. Effective tourism management will

enhance the destination's attractiveness to tourists. However, the gap in sports tourism management techniques between developed and developing countries significantly impacts the level of national revenue from the tourism sector. Developing countries need to consider key factors, such as optimizing resource management and marketing strategies, as tools for destination promotion to stimulate economic growth (14). Government support plays a crucial role in the sustainability of rural sports tourism development, contributing to socio-economic progress (15). The government, local community, and private sector need to develop tourism programs that align with long-term development strategies to generate income, improve the standard of living for the population, and preserve the country's cultural heritage (16).

This study aims to identify research trends related to the development of sports tourism, with a focus on cultural heritage sports tourism and tourism activities related to the history of local sports development. All forms of activities offered, the motivations of tourists to participate, their impact on local social, cultural, and economic aspects, their impact on cultural heritage, their impact on visitors, the implications and reflections of the research findings, and the gaps identified in this study will be described through bibliometric analysis. The gaps identified in this study provide a foundation for researchers to develop sustainable cultural heritage sports tourism initiatives. Topic mapping using bibliometric analysis is crucial for identifying gaps in previous research related to sports tourism, cultural heritage, and the history of cultural heritage, as well as the patterns of scientific collaboration that have emerged within these fields. Although bibliometric analysis has its drawbacks, one of which is its short-term nature, it can facilitate researchers' broader review of scientific fields by highlighting the gaps it reveals (17). The gaps and clusters identified in the bibliometric analysis provide a basis for researchers to conduct further, focused research. Findings from previous research, including resource management, promotional strategies, and collaboration, can help stakeholders design sustainable sports tourism initiatives in their regions.

MATERIALS AND METHODS

Study design. This study aims to determine research trends related to cultural heritage sport

tourism. This study employs a literature review approach, combining bibliometric analysis and systematic review, which is referred to as a mixed review (18, 19). These two methods complement each other and offer advantages for researchers in achieving the research objectives (17).

Data Collection. The research results from the Scopus database have undergone several review stages by a team of expert reviewers. Therefore, the primary data source used in this study is Scopus. The research team also added the PubMed database to expand the scope of the database used. The research team sorted articles in the Scopus database on May 4, 2025, using the Harzing Publications application. The research team did not enter a specific date in determining the publication year range. Researchers entered data from 2016 to 2025, using two main keywords: "Culture heritage tourism sport" and "Historical Tourism Sport". The collected manuscripts were then saved in RIS format for sorting and organization.

Sorting is performed to ensure the data's relevance to the selected topic. Inclusion and exclusion criteria in data sorting are based on 1) Articles must focus on cultural heritage sports tourism, which includes sports activities and the history of the sport itself, 2) Articles without peer review and final project results (e.g., theses and dissertations) are excluded, and 3) Articles must be in English and complete.

The research team imported the raw data in RIS format into Mendeley Desktop to begin the sorting process. The sorting process was carried out in three stages: first, the research team removed duplicate articles. Second, the research team reviewed the articles based on their titles, abstracts, and keywords to ensure relevance. Third, the research team reviewed the entire article content through discussion. A total of 101 studies that met the inclusion criteria were used in this study. Data were stored in CSV format for analysis using VosViewer. The data collection procedure is shown in Figure 1.

Data Analysis. Bibliometric analysis was performed using VosViewer 1.6.20, utilizing sorted data in CSV format, on May 9, 2025. First, we analyzed co-authors to examine social interactions and international collaborations between authors. The co-author analysis included both author units and country units. Second, we conducted a citation analysis focusing on country units to understand the relationships between publications by identifying the most influential

publications. Third, we conducted a co-occurrence analysis to understand the trends in research topics and the clusters that formed.

Limitations. Several limitations may still occur, despite the research being comprehensive. First, the limited selection of databases and keywords may result in relevant studies being filtered out. Second, the restriction to English-language articles may result in relevant studies in non-English languages being filtered out. Third, emerging trends may be less accurate due to the possible omission of qualitative analysis. This is because bibliometric analysis essentially focuses on the quantitative aspects of the collected data.

RESULTS

The results of the analysis include the number of publications, the number of citations, the most cited articles, a coupling bibliography, and network analysis, which includes co-authorship and co-occurrence (Figure 1). In detail, the findings in this study are presented in the following subchapters:

Performance Analysis. Figure 2 describes the number of publications over ten years each year. Examining the number of publications each year reveals three distinct periods of publications related to cultural heritage sports tourism. The period spans from 2016 to 2018, with the peak number of publications occurring in 2017. During the first peak period, research focused on the history of sports development and techniques for creating sports tourism sites, as well as the history of cultural heritage sports, such as martial arts (20-24). The second period spans from 2019 to 2023, with the peak number of publications occurring in 2020. At the peak of the second period, publications explored topics related to sports historiography, the Czech tradition of "Tourism and Outdoor Sports," tourist motivation to participate in hiking along the Ancient Tea-Horse Road, the regeneration and revitalization of historical properties, and the development of sports tourism based on cultural uniqueness (25-29). The third period spans from 2023 to 2025, with a peak in 2024. During the peak of the third period, research focused on sports tourism management, the use of digital media to promote sports events and cultural heritage, the development of sustainable sports tourism, preserving historical sites affected by sports tourism activities, evaluating safety management, and motivation to participate in sports tourism activities (1, 6, 11-13).

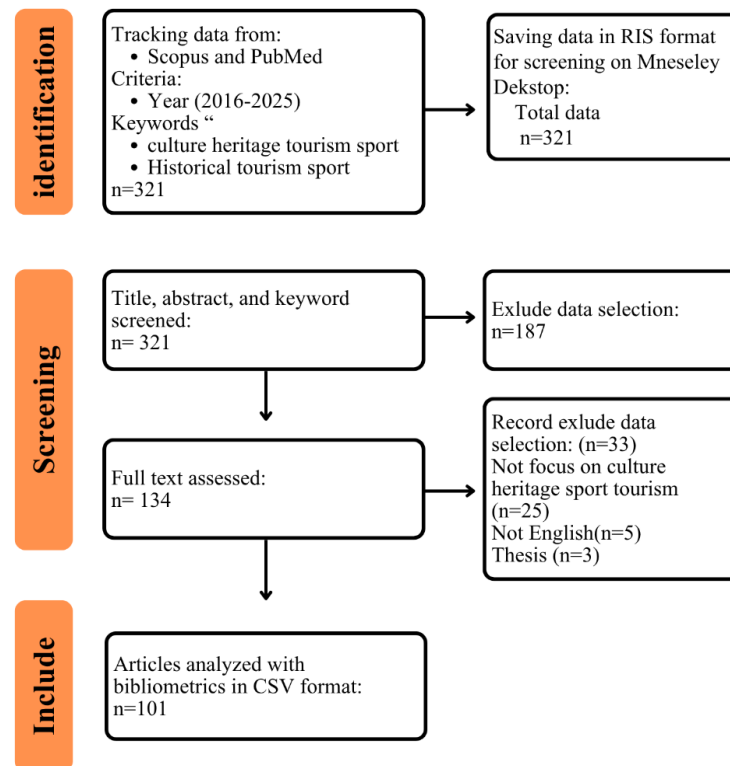


Figure 1. Flow chart of study design

Figure 2 shows the number of citations obtained each year. The collection of articles or scientific papers published in 2018 had the highest number of citations, with 126 citations. This is followed by publications in 2020 with 56 citations, 2017 with 43 citations, and 2021 with 40 citations, and the year 2018 had the highest number of citations due to several factors, including the fact that research conducted in 2018 was part of the first research period and had been published for a longer period. This allowed researchers in

subsequent years to cite studies published in the first period. Additionally, the number of documents published in the first period was relatively smaller compared to the second and third periods. Therefore, researchers in subsequent years had fewer options and alternatives. Findings from the first publication are often used as the theoretical foundation and reference for developing research in subsequent years. This is why studies published in the first period generally have a high number of citations.

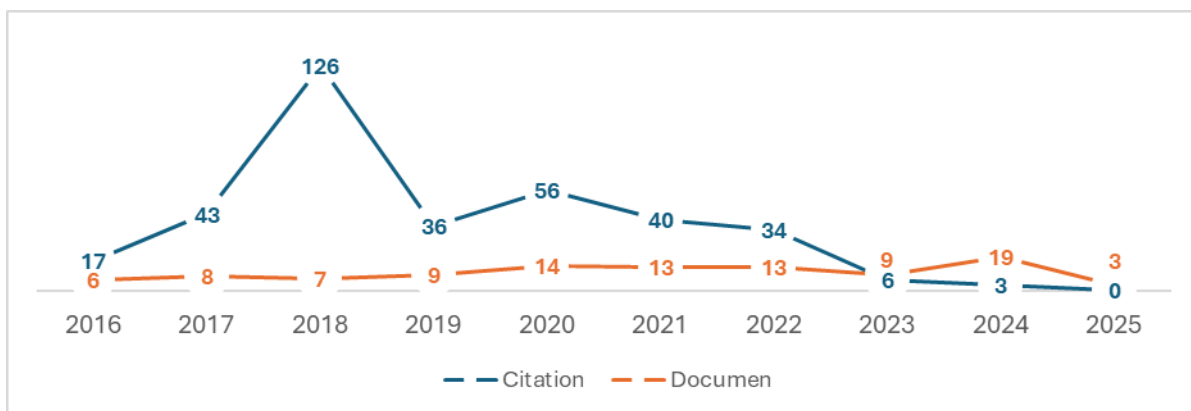


Figure 2. Number of publications and citations each year.

Note. The number of document publications was manually sorted by year in the Mendeley Desktop application. Meanwhile, the number of citations for each document was manually reviewed individually for each manuscript in the Scopus database. Sorting of articles from the database and data analysis process conducted on May 4, 2025.

Table 1 presents a list of ten articles or scientific papers with the most citations in the sorted collection of publications. The study examining the relationship between the level of event organization and tourism development and its impact on the host's image ranks first with 70 citations (10). The findings of this study inspire the organization of small-scale sports events to implement sustainable management of sports

events that are culturally relevant to a region's heritage. Given its positive benefits for sustainable tourism development in the region. The second article, with 21 citations, presents a contemporary correlation between cultural heritage, sports, and tourism in Poland. The research findings indicate that the development of sports heritage in relation to tourism remains inadequate in Poland (30).

Table 1. Most cited articles

Title/Doi	Author	Year	Citation	Ref.
A small-scale event and a big impact-Is this relationship possible in the world of sport? The meaning of heritage sporting events for sustainable development of tourism: experiences from Poland	Malchrowicz-Moško, Ewa & Poczta, Joanna	2018	70	(10)
Sport tourism: A growth market considered from a cultural perspective	Malchrowicz-Mosko, Ewa & Munsters, Wil	2018	21	(30)
Event bidding: Politics, persuasion, and resistance	McGillivray, David & Turner, Daniel	2017	18	(31)
Lithological and structural control on Italian mountain geoheritage: Opportunities for tourism, outdoor and educational activities	Bollati, Irene. Coratza, Paola. Panizza, Valeria. Pelfini, Manuela	2018	17	(7)
Mobilising Stoke: A Genealogy of Surf Tourism Development in Miyazaki, Japan	Doering, Adam	2018	15	(32)
Characterizing traveling fans: a workflow for event-oriented travel pattern analysis using Twitter data	Xin, Yanan & MacEachren, Alan M.	2020	14	(33)
Martial arts tourism of the "Europe—Far East" direction, in the opinion of grand masters	Figueiredo, Abel A. Błach, Wiesław. Bujak, Zbigniew. Maroteaux, Roland J. Cynarski, Wojciech J.	2020	13	(34)
Spatial assessment of audience accessibility to historical monuments and museums in Qatar during the 2022 FIFA World Cup	Mansour, Shawky. Alahmadi, Mohammed. Abulibdeh, Ammar	2022	13	(35)
The rise of trail running in South Africa: Possibilities for small-scale sports tourism	McKay, Tracey. McEwan, Lynsey. Baker, Melissa	2019	12	(36)
Congress in Rio Maior: The particular example of martial arts tourism and scientific tourism	Cynarski, Wojciech & Kubala, Krzysztof	2017	10	(37)

Note. The most cited articles are identified from the ranking of the article collection in the database, which has been sorted according to the provisions outlined in the method section. The number of citations is obtained based on manuscript information in the Scopus database. Sorting of articles from the database and data analysis process conducted on May 4, 2025.

The government should follow the example of other countries, as international travel related to tourism represents a promising market for the country. Third, a book containing reflections on various critical issues of contemporary significance in the context of event bidding, including ethical and governance issues surrounding the development and organization of events, with 18 citations (31). Fourth, research related to the potential utilization of the Alpine and Apennine mountain ranges and the island of Sardinia, which are geological mountain heritage sites, in certain outdoor activities that utilize outdoor sports (e.g., rock climbing, whitewater rafting, speleology) has 17 citations (7).

The fifth study aims to detail the convergence of surfing culture and tourism development from 1930 to 2016, examining how surfing tourism was mobilized in Miyazaki as a tool to revitalize the local economy, with 15 citations (32). The sixth scientific investigation examines the travel patterns of tourists using geographically tagged microblogs, yielding promising results in uncovering long-term travel patterns that extend beyond sports events, citing 14 sources (33). The seventh study examines martial arts tourism, a form of cultural, sports, and educational tourism, citing 13 references (34). The eighth study evaluates the geographical accessibility of

archaeological sites, monuments, and museums across Qatar, citing 13 references. This research provides clear guidance on how to represent cultural heritage and national history to a global audience during major events in 2022 (FIFA World Cup) to maximize socio-economic benefits (36). Eight studies examined South African trail running tourism, which has the potential to boost the tourism economy and increase local and international tourist visits, with 12 citations (36). The tenth study focuses on a congress dedicated to the theme of martial arts within a specific general scope, as its objectives complement each other, in terms of scientific research and martial arts studies, with 10 citations (37).

Sources with the highest number of articles and citations. This technique identifies relationships between articles by analyzing similarities in references. This analysis is used to group research topics with related themes, thereby facilitating the retrieval of information. Additionally, this analysis is used to increase citation indexes and to understand the relationships between research topics. Figure 3 presents the top five journals with the highest

number of articles or scientific works on the theme of cultural heritage sports tourism. In first place is "Ido Movement for Culture" with a total of 5 publications and 41 citations. Publications in this journal include studies related to cultural heritage martial arts in Asia and Europe, as well as their connection to sports tourism (21, 30, 37-39). The second is the "Journal of Sport and Tourism" with five published documents and 18 citations. Articles in this journal examine sports museums with nostalgic and commercial value, the Pahlevani and Zoorkhanei rituals as creative cultural products that attract tourists, the motivation of tourists to contribute to Muay Thai sports tourism, contemporary sports tourism policies in Scotland, and the claim of regions as the home of specific sports branches (8, 9, 40-43). Third, "Teoriya i Praktika Fizicheskoy Kultury" with five documents and five citations. Publications in this journal examine physical culture and sports in education, the history of children's sports tourism, the history of amateur sports tourism in Udmurtia, the impact of mega-events on sustainable development, and barriers to tourism (4, 44-47).

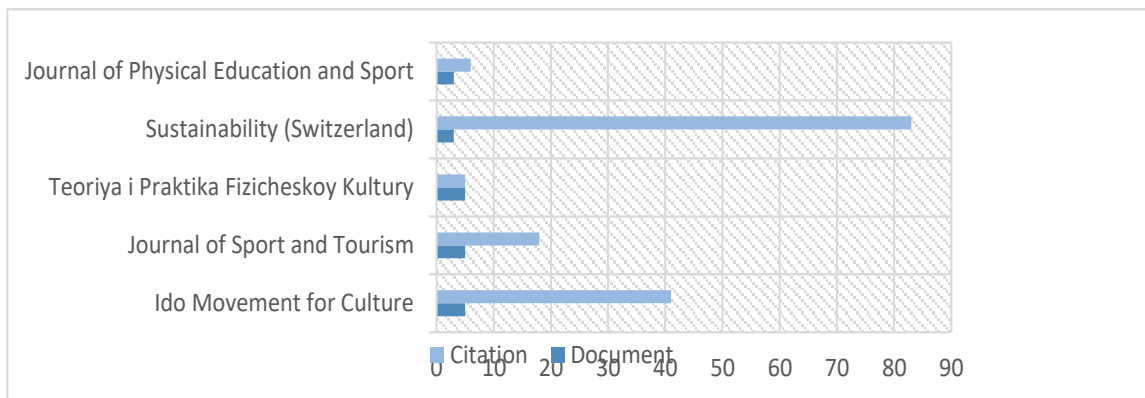


Figure 3. Document and cite each source

Note. The ranking of the five impactful journals was done manually by sorting the sources/journals in the Mendeley Desktop application. Meanwhile, the number of citations obtained for each journal/source was manually calculated by reviewing the number of citations for each document in the Scopus database. The ranking was conducted on May 4, 2025.

Fourth, "Sustainability (Switzerland)" with three documents and 83 citations. The documents published in this journal examine the role of cultural heritage sports events in the sustainable development of tourist destinations, martial arts tourism as a form of cultural tourism, and the cultural and environmental motivations behind athletes traveling to other countries or destinations

to compete (6, 10, 34). The documents published in the journal provide a historical review of the scientific literature related to the physical qualities required to achieve optimal rock climbing techniques in sports tourism activities, as well as the need for methodological support from the educational process in participating in sports tourism activities (24, 48).

Co-authorship analysis with the author unit of analysis. Co-author analysis is used to identify patterns of collaboration between researchers. This allows readers to identify researchers who frequently collaborate and work together. Additionally, this co-authorship analysis can also

be used to assess the productivity levels of authors. Figure 4 presents the results of the co-author analysis, where different colors indicate distinct clusters. The analysis identified three clusters, with Malchrowicz-Moško, Ewa, as a co-author on three published documents.

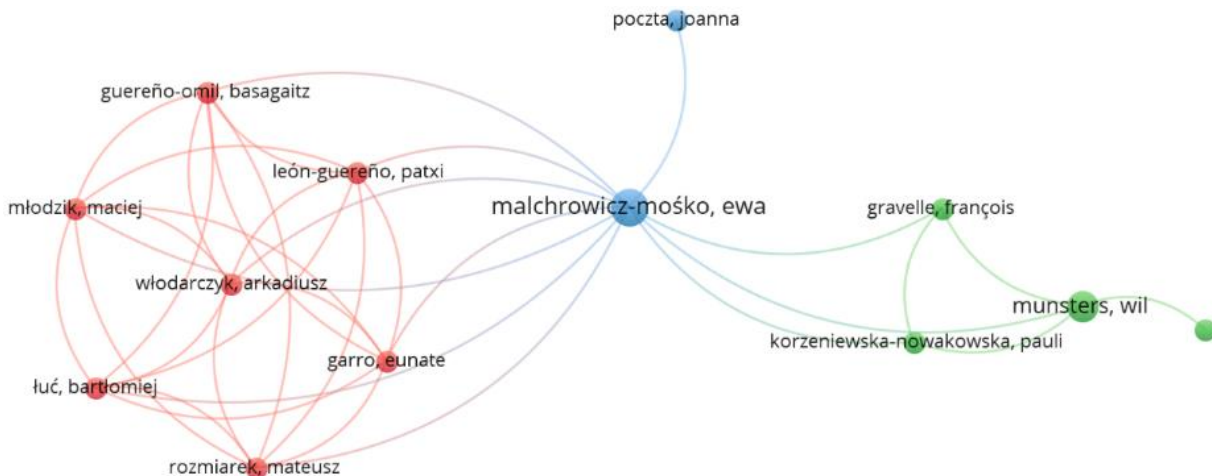


Figure 4. Co-author network visualization illustrates the collaboration among researchers and the frequency of publications related to the research topic.

Co-authorship analysis based on the author analysis unit is set with a minimum of one document from each author and produces three clusters. The co-authorship analysis in the VosViewers application was conducted on May 9, 2025.

- Cluster I (Red) with the collaboration group Basagaitz Guereño-Omil, Patxi León-Guereño, Eunat Garro, Mateusz Rozmiarek, Maciej Młodziak, Arkadiusz Włodarczyk, Bartłomiej Łuć, and Ewa Malchrowicz-Moško as co-authors. The research examined in the first cluster analyzes the motivations of sports tourists while comparing the motivations that lead mountain runners and city runners to participate in competitions (6).
- Cluster II (Green) with the collaboration group Wil Munsters, Paulina Korzeniewska-Nowakowska, François Gravelle, and Ewa Malchrowicz-Moško as co-authors. The research conducted by the second cluster group examines the controversial aspect of animal tourism, which has received little attention, specifically its relationship with cultural tourism (49).
- Cluster II (Green) with the collaboration group, Joanna Poczta and Ewa Malchrowicz-Moško as co-authors. The research conducted by the third cluster group examines the importance of small-scale sports events, as well as cultural heritage sports events, for the sustainable development of tourist destinations (10).

Table 2 shows the top 13 researchers who acted as co-authors with the highest number of published documents and total link strength. First, Cynarski, Wojciech, has four published documents with a total link strength value of 4. Second, Ewa Malchrowicz-Moško has three published documents with a total link strength value of 3. Third, Abdeldayem, Marwan; Batalova, L. V.; Martín-González, Roberto; Merzlyakova, G. V.; Munsters, Wil; Ratueva, Olga; Romano, Fillipe Soares; Sobolev, Stanislav; Saboleva, Natalia; Swart, Kamilla; Uvinha, Ricardo Ricci have two published documents with a total link strength value of 2.

Co-authorship analysis with country units of analysis. Figure 5 illustrates the collaborative network of researchers across countries. The United Kingdom and China have extensive international collaboration networks with other countries. The rapid growth of Chinese researchers in the field of cultural heritage sports tourism research is closely tied to government support in efforts to preserve and maintain cultural heritage sports (50). Research collaboration between countries is crucial for addressing the global challenges of cultural heritage and sports tourism in the future.

Table 2. List of 13 co-authors sorted by number of documents and total link strength.

Author	Document	Total link strength
Cynarski, Wojciech j	4	4
Malchrowicz-Moško, Ewa	3	3
Abdeldayem, Marwan	2	2
Batalova, L. V.	2	2
Martín-González, Roberto	2	2
Merzlyakova, G. V.	2	2
Munsters, Wil	2	2
Ratueva, Olga	2	2
Romano, Fillipe Soares	2	2
Sobolev, Stanislav	2	2
Saboleva, Natalia	2	2
Swart, Kamilla	2	2
Uvinha, Ricardo Ricci	2	2

Note. Co-author analysis results illustrate the top 13 correspondence authors sorted by the frequency of publication documents according to the research topic. The total link strength threshold used in co-authorship is set to 2. The co-authorship analysis was conducted on May 9, 2025.

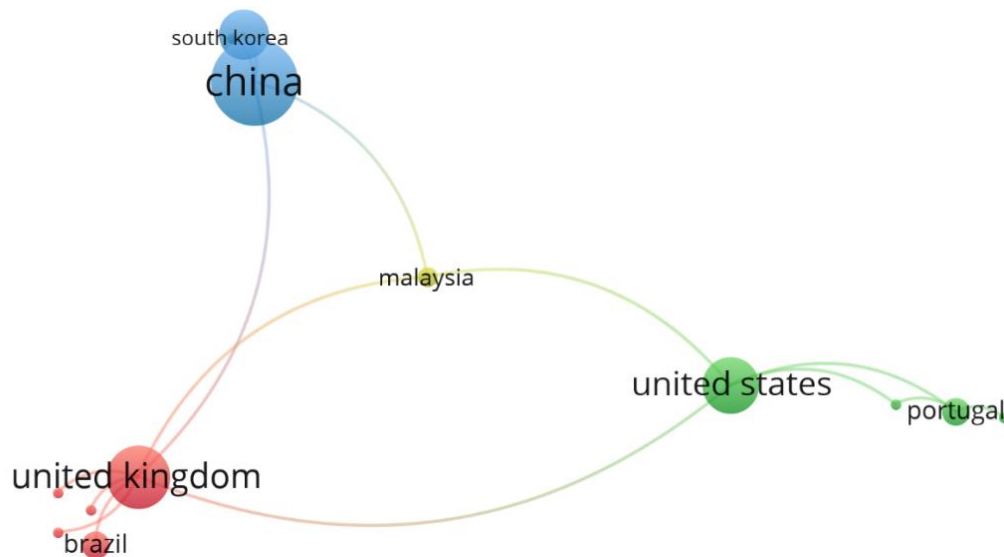


Figure 5. Co-authorship analysis based on country analysis units is determined by (1) a minimum of 1 document from the author, (2) the total number of selected countries is determined, (3) the minimum number of citations for a country is 1, resulting in 3 clusters. Co-authorship analysis on the VosViewers application was conducted on May 9, 2025.

Citation analysis with country units of analysis. Figure 6 shows 31 countries that are productive and influential in research on cultural heritage sport tourism. In terms of the number of participants, the United Kingdom, China, Qatar, and Italy are the most active developed countries in exploring this research topic, as evidenced by the high research impact. These countries have cultural heritage sports (e.g., local martial arts, football, cricket, equestrianism) that are interesting and popular with people worldwide (51, 52). Historical sites related to sports (e.g., Lord's Cricket Ground, National Football Museum, Royal Ascot, Temple of Heaven) are also interesting topics for research due to the high interest of

tourists in visiting (8, 53). These countries also frequently host world-class mega-sports events (e.g., the FIFA World Cup, the Olympics), which, of course, have a positive impact on the tourism sector and also provide numerous topics for researchers to study (54, 55). The details of the 15 countries with the highest productivity and influence on research in cultural heritage sport tourism are presented in Table 3.

Co-occurrence Analysis. Co-occurrence is used to display the network between keywords that frequently appear in the group of documents being analyzed. This analysis enables researchers to identify the primary topics that are frequently studied, based on keywords that often appear

together. Figure 7 displays a visualization of the network formed between groups of interrelated keywords. There may be differences in circle size, with larger circles representing keywords that appear frequently and smaller circles indicating keywords that appear less frequently. This may also indicate that frequently appearing keywords are those with higher research frequency. Differences in network distances between keywords can also be observed. Long connections

between keywords indicate distant relationships, while short connections between keywords indicate closer relationships between keywords or topics.

Additionally, the network visualization displays different colors for each circle. Similar colors indicate the formation of clusters, with the network visualization in this analysis resulting in 7 clusters. The collection of keywords spread across each cluster is shown in Table 4.

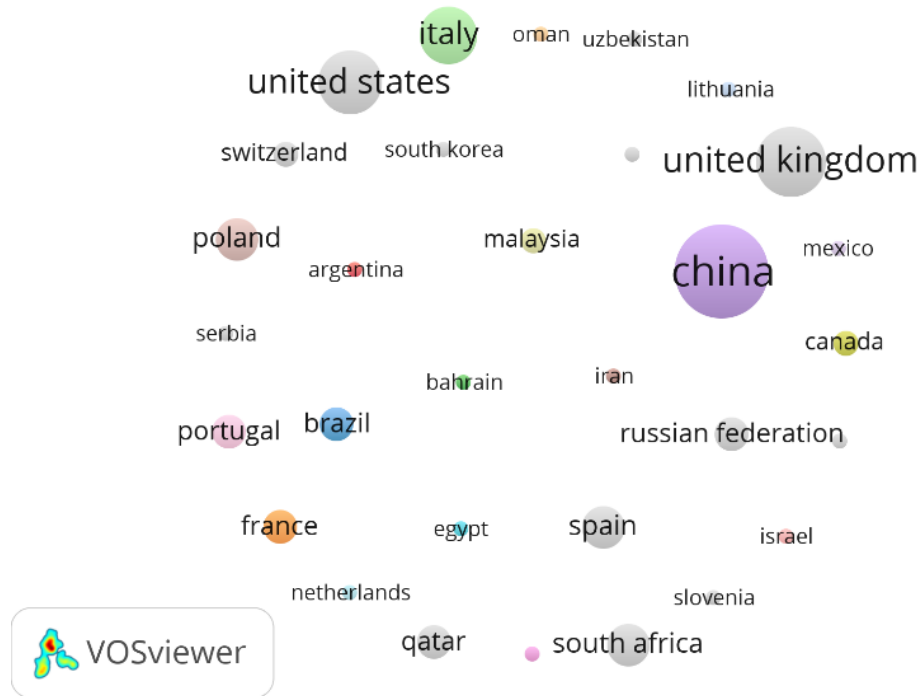


Figure 6. Citation analysis based on country analysis units is determined by (1) a minimum of 1 document from the country, and (2) the minimum number of citations for a country is 1. A citation analysis of the VosViewers application was conducted on May 9, 2025.

Table 3. Most productive and impactful country in cultural heritage sport tourism research

Most Productive Countries	Documents	Most Cited Countries	Citation
China	12	United Kingdom	61
United Kingdom	8	United States	49
United States	7	Qatar	44
Italy	6	South Africa	32
South Africa	4	Egypt	29
Spain	4	Oman	29
Poland	4	Saudi Arabia	29
Brazil	3	Spain	28
France	3	China	27
Portugal	3	Italy	21
Qatar	3	Poland	18
Russian Federation	3	Slovenia	18
Canada	2	France	16
Malaysia	2	Portugal	9
Switzerland	2	Canada	9

Note. A list of countries resulting from the citation analysis based on country analysis units, sorted by the highest number of documents and citations. The citation analysis with VosViewers was conducted on May 9, 2025

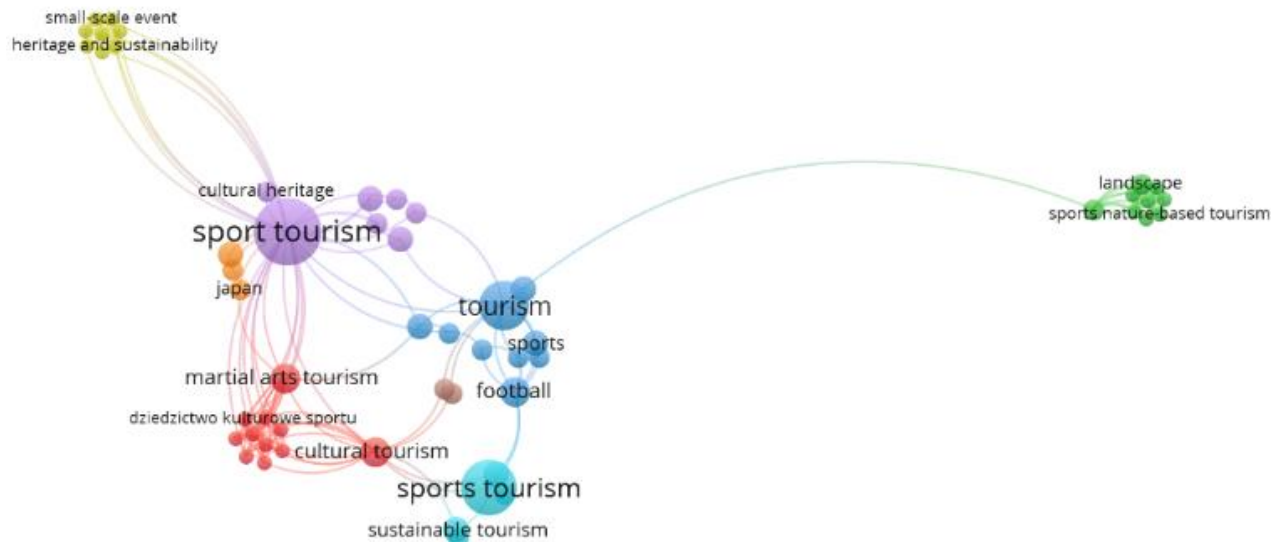


Figure 7. Co-occurrence Network visualization illustrates the cluster groups formed from the database, which has been sorted based on the provisions in the method section and analyzed using VosViewer. Co-occurrence analysis based on keyword analysis units is set with a minimum number of keyword occurrences of 1. Co-authorship analysis was conducted on May 9, 2025.

- Cluster I (red), referred to as "cultural heritage tourism potential," comprises key groups of cultural heritage, including sport, cultural tourism, martial arts tourism, and sport heritage tourism. The main topic of this cluster, based on the key keywords, involves an assessment of the potential for cultural heritage tourism in Poland and worldwide, with relevant examples. The results of the study show that the development of tourism related to sports heritage in Poland has great tourism market potential (30). The government needs to follow in the footsteps of other countries in regulating tourism, given the inadequacy of managed sports heritage tourism. An example is the Japanese government's strategy of commercializing karate, a traditional martial art, to attract visitors. In addition to preserving cultural heritage, the Japanese government also expects economic growth from commercializing karate (38). This cluster also includes visitor travel in understanding the different cultural and historical contexts in each country where martial arts heritage originated (21).
- Cluster II (Green), referred to as "Rural Landscape and nature," consists of the keywords heritage resources, kitesurfing,

landscape, Spain, sport-nature-based tourism, surfing, Tarifa, and windsurfing. The main topic of this cluster, based on the main keywords, examines rural landscapes as historical and cultural products that have the potential for regional development and knowledge about lesser-known tourist destinations (56). This cluster examines various factors important in the formation of sports tourism, specializing in outdoor and water sports (including windsurfing, surfing, and kitesurfing). The factors that need to be considered in the formation and development of sports tourism destinations include the geographical, physical, and environmental landscapes, as well as socio-cultural factors (57).

- Cluster III (Blue), previously known as "about tourism," comprises a set of keywords: tourism, sports, football, museums, outdoor sports, and sustainability. The topics in this cluster are based on the keyword with the highest occurrence, "tourism," which presents various forms of sports tourism activities spread across several countries. The various types of sports tourism found in this cluster include the cultural heritage of Pahlevani and Zoorkhanei martial arts rituals as creative cultural products, the integrated development

process of the sports and cultural tourism industry, cultural tourism packaged in the form of adventure and outdoor recreation, and

the effect of sporting events in supporting tourism and the culture of the organizers (8, 34, 58-60).

Table 4. Keyword co-occurrence

Cluster I	Occurance	Total link strength
Cultural tourism	4	4
Martial arts tourism	4	4
Cultural heritage of sport	1	1
Sport heritage tourism	1	1
Cluster II	Occurance	Total link strength
Landscape,	2	2
Surfing	2	2
Heritage resources	1	1
Kitesurf	1	1
Sport-nature-based tourism	1	1
Tarifa	1	1
Klaster III	Occurance	Total link strength
Tourism	11	11
Football	4	4
Outdoor sports	3	3
Sustainability	3	3
Sport	2	2
Cluster IV	Occurance	Total link strength
Sustainable development	2	2
Heritage and sustainability	1	1
Heritage management	1	1
Small-scale event	1	1
Sport management	1	1
Cluster V	Occurance	Total link strength
Sport tourism	21	21
Nostalgia	3	3
Sport heritage	3	3
Heritage sport tourism	2	2
Culture heritage	2	2
Cluster VI	Occurance	Total link strength
Japan	2	2
Surf tourism	2	2
Klaster VII	Occurance	Total link strength
Combat sport	2	2
Martial art	2	2

Note. List of the top 5 keywords in each cluster. The minimum total link strength threshold used in co-occurrence is set to 1. The co-occurrence analysis was conducted on May 9, 2025.

- Cluster IV (yellow), referred to as "Small Events Impact on tourism sustainability," has the keyword groups of heritage, sustainability, heritage management, heritage sporting events, small-scale events, sport management, and sustainable development. The main topic in this cluster examines the benefits of small-scale sporting events, such as marathons or other recreational activities, that have a positive impact on the sustainable development of visitor areas. Good management is a key factor in ensuring that planned activities can be carried out sustainably (13). Activities that are already underway inspire the organization of small-scale sporting events to implement sustainable maintenance, ensuring that sporting events related to a region's cultural heritage remain sustainable (10).
- Cluster V (purple), referred to as "nostalgia sport tourism," consists of the keywords culture heritage, hall of fame, heritage sport tourism, nostalgia, sport heritage, and sport tourism. This cluster examines various types of research related to the sustainable development of cultural heritage sport tourism, including systematic reviews, surveys, case studies, exploratory studies, development, and evaluation. In particular, the main topic examined is the keyword nostalgia. Sports museums are often commercial destinations that serve as a nostalgic repository for the historical documentation of a sport. The National Baseball Hall of Fame (NBHF) in Cooperstown, New York, serves as both a visitor attraction and a repository of baseball history, offering excellent service. Thus, the NBHF can serve as an example for other sports and popular culture museums that may be cautious in incorporating narratives (40). The development of digital archiving as a method of preserving the historical values of sports is necessary to reduce inaccurate narratives (61).
- Cluster VI (orange), subsequently referred to as "the convergence of surfing culture," has the keyword groups Japan and surf tourism. The study explains that surf tourism is mobilized in Miyazaki as a tool to revitalize the local economy. The reflection from this study concerns how the development of surf tourism can potentially divide the local surfing community and identify areas for future

research on the development of surfing destinations ahead of the 2020 Tokyo Olympics (32).

- Cluster VII (brown), referred to as "combat sport," consists of the keyword groups "combat sport" and "martial arts." This cluster examines the activities of martial arts experts' congresses to discuss knowledge about scientific tourism. Scientific tourism and martial arts are non-entertainment and cultural tourism. The study of the perspectives of scientific tourism and martial arts tourism through further discussion needs to be explored in greater depth (34).

DISCUSSION

Although local socio-cultural conditions shape cultural heritage sport tourism, the prospects for tourism development still need to be explored to optimize its utilization. This study is a preliminary investigation into the various forms of cultural heritage tourism development that researchers have explored over the past decade. Based on descriptive data, the initial research period relates to the development of winter sports tourism, specifically skiing (20). Scientific tourism related to the study of cultural heritage, including sports such as martial arts, was also explored during the first period of development (37). In the second period, the development of sports tourism based on cultural uniqueness began to be promoted due to its potential for regional development (25). Meanwhile, in the third period, researchers began developing safety management for tourists participating in outdoor tourism activities. This occurred due to the increasing interest of tourists in participating in outdoor recreational activities (13).

The results of the bibliometric analysis have detailed the cluster grouping based on keywords in research topics related to cultural heritage sports tourism. Cluster V has the highest keyword occurrence rate. In Cluster V, research focuses on the development of sustainable cultural heritage sports tourism. The architectural heritage of sports included in the UNESCO list has a special appeal for millions of tourists (62). It is essential to develop cultural heritage tourism, considering that tourists visiting sports heritage sites will increase in the future (30). This proves that developing sustainable heritage sports tourism can also spark interest in a country's heritage sports. This way, heritage sports can maintain

their authenticity and gain more widespread recognition.

The bibliometric analysis also illustrates the prolific authors and collaborations between countries that influence research topics. Developed countries, such as the United Kingdom, China, Qatar, and Italy, are productive and have a significant influence on research related to cultural heritage and sports tourism. The availability of resources and funding is a crucial factor in exploring the development of cultural heritage sports tourism (63, 64). Based on the funding ratio of BRICS countries, China achieved the highest funding ratio, followed by Brazil, Russia, and South Africa (65). Increasing the research funding ratio is necessary for scientific development (66). In addition to funding, international collaboration among researchers is also crucial for addressing global challenges in the development of cultural heritage sports tourism.

This study makes a substantial contribution to the expansion and consolidation of knowledge about cultural heritage sports tourism and its potential implications for sustainable tourism development. On the other hand, this research presents the results of a bibliometric analysis that enables the establishment of important indicators for sustainable tourism development, considering several key factors. Among them are the most studied topics, considering the advantages and disadvantages of each form of tourism that is already in operation, as well as the main sources of top publications and those with high impact factors. In addition, matters related to visitors, such as service, safety, and travel experience, also need to be considered (67). It is also important to examine the motivation of visitors to visit or participate in sports tourism activities (6). Managers can take into account the motivations of each visitor when developing the tourism packages they offer.

The findings in this study are crucial for researchers to establish the theoretical basis of topics previously studied and predict future research trends in the development of cultural heritage sports tourism. For example, how to make outdoor activities that are made not to disturb cultural or natural heritage, what are the strategies to ensure the safety and security of tourists, how the designs offered can cover all generations, how the authenticity of sports heritage remains sustainable, how tourists can

feel past events from historical relics of the past, and how to organize small events or mega events that can have a high socio-economic impact. In addition to researchers, stakeholders also benefit from the findings of this study, which relate to the strategies applied in providing cultural heritage sports tourism. For practitioners, the results of this study can be used to evaluate tourism designs that have been prepared or used in further design development.

CONCLUSION

This study presents a bibliometric analysis and systematic review that highlight key themes in the development of cultural heritage sports tourism. Based on a systematic review of contributors, influential countries, and research trends, we identified a significant surge in emerging trends over the past ten years. This indicates increased academic interest in cultural heritage sports tourism, its impact on the economy, society, and sustainability. The analysis resulted in seven main clusters: cultural heritage tourism potential, rural landscape and nature, tourism, the impact of small events on tourism sustainability, nostalgia and sports tourism, the convergence of surfing culture, and combat sports. These clusters illustrate the numerous subfields studied in cultural heritage sports tourism for its sustainable development. The differences in cultural heritage sports within countries reveal different research priorities. These differences enrich our understanding of how each country packages and offers cultural heritage sports tourism to tourists. The findings of this study provide an overview of the various forms of cultural heritage sports tourism activities spread throughout the world. Several implemented activities provide benefits to tourists and have a positive impact on the social and economic conditions of local communities. The findings of this study also provide opportunities for future researchers to develop sustainable cultural heritage tourism sports by focusing on the preservation of cultural heritage itself.

APPLICABLE REMARKS

- Cultural heritage sports tourism has significant potential in the tourism market, as illustrated in Cluster I.
- Digital archiving of cultural heritage sports is crucial for preserving them, as illustrated in co-occurrence cluster V.

- Providing good service to visitors or participants in sporting events is essential for maintaining the host's image, as illustrated in the top-cited article.

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AUTHORS' CONTRIBUTIONS

Study concept and design: Sigit Nugroho. Acquisition of data: Yudik Prasetyo. Analysis and interpretation of data: Dewi Nurhidayah. Drafting of the manuscript: Dewi Nurhidayah. Critical revision of the manuscript for important intellectual content: All. Statistical analysis: Sulistiyono. Administrative, technical, and material support: All. Study supervision: All.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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Based on this literature review, we do not require ethical approval.

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