



Mapping Social Support and Barriers in Adaptive Sports: Bibliometric Implications for Inclusive Physical Education

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ABSTRACT

This study provided a structured bibliometric mapping of research on social support and participation barriers in adaptive sports for athletes with disabilities and examined its implications for inclusive physical education. A bibliometric analysis was conducted using the Scopus database, covering publications from 2015 to 2025. A systematic search was conducted on 31 December 2025, identifying 142 documents. A total of 71 peer-reviewed English-language journal articles met the inclusion criteria and were analyzed following the PRISMA protocol. VOS viewer was employed to analyze publication trends, country contributions, collaboration networks, citation structures, and keyword co-occurrence patterns. Findings indicated a substantial increase in publication output since 2022, peaking in 2025 with 24 articles. Research production was concentrated in Europe and North America, led by Spain (10 publications), the United Kingdom (9), and the United States (8). Four major thematic clusters were identified, including psychosocial aspects and quality of life, social support and psychological factors, structural barriers and participation inclusivity, and clinical and rehabilitative approaches. The analysis revealed a fragmented knowledge structure, with limited integration between psychosocial and structural dimensions. This study advances the field by explicitly mapping their intersection and proposing integrative, policy-oriented directions to strengthen inclusive physical education.

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INTRODUCTION

Adaptive sports have received increasing attention at both national and international levels and have gained broader popularity over the past decade (Raya et al., 2022). Beyond this growing visibility, adaptive sports are also recognized as a mean of enhancing participation and wellbeing among athletes with disabilities, alongside the expansion of adaptive sport events and the increasing recognition of rights, social inclusion, and equality for individuals with disabilities (Mira et al., 2023). A substantial body of research indicates that participation in adaptive sports contributes positively to physical health, psychological well-being, mental resilience, and social support among athletes with disabilities (Zabala-Dominguez et al., 2024). Engagement in adaptive sports further enables individuals with disabilities to develop their potential, enhance self-confidence, and expand social interactions in more inclusive ways (Isidoro-Cabañas et al., 2023).

The term adaptive sport and recreation refers to any modification of sport or recreational activities designed to accommodate varying levels of ability among individuals with disabilities (Iverson et al., 2022). Adaptive sports use classification systems that provide structural frameworks for fair competition among athletes with disabilities (Tweedy et al., 2016). By involving individuals in activities tailored to their needs and interests, rehabilitation programs aim to support the development of skills and independence necessary for participation in a wide range of activities beyond the rehabilitation context (Miklos et al., 2023). Advances in assistive technology have the potential to improve athletic performance and safety through modern prosthetics, specialized sport wheelchairs, and digital support devices (Liu et al., 2025).

Adaptive sports are grounded in principles of inclusivity that emphasize participant centered approaches, the active involvement of individuals with disabilities in planning processes, and a focus on abilities rather than impairments (Bailey et al., 2023). Within adaptive sports, co-design approaches facilitate a deeper understanding of users lived experiences and enhance the relevance of resulting design strategies (Bolster et al., 2021). Emphasizing strengths rather than limitations places individual capabilities above disability related constraints (Schwartz et al., 2023). Accordingly, sport is increasingly viewed as a strategic mechanism for empowering individuals with disabilities across multiple dimensions, including physical, psychological, social, economic, and symbolic representations that can inspire shifts in societal perceptions (Mira et al., 2023).

In practice, participation levels among athletes with disabilities in adaptive sports are strongly influenced by the availability of social support as well as the presence of structural and social barriers (Kunene 2025). Emotional forms of social support, including motivation, encouragement, and recognition of effort rather than solely outcomes, play an important role in building confidence, enhancing achievement motivation, and strengthening athlete identity within inclusive sport communities (Mira et al., 2023). Instrumental support refers to the provision of direct practical assistance, such as financial aid and material resources (Kim et al., 2020). Informational support is reflected in the role of coaches with high levels of technical and tactical expertise who are able to provide meaningful guidance to athletes (Aitchison et al., 2021).

Conversely, limitations in accessible sport facilities often manifest through inadequate infrastructure, transportation difficulties, and restricted accessibility (Jaarsma et al., 2014). Additional barriers include societal stigma, insufficient training for coaches and sport

administrators, and discriminatory attitudes rooted in ableism, defined as the belief that nondisabled bodies represent the normative ideal, which together constitute serious cultural obstacles to participation (Elife-Lorenzo et al., 2025). Psychological barriers such as fear of injury, low self motivation, and limited self confidence have also been identified as significant factors constraining participation in adaptive sports (Duyan et al., 2025; Liu et al., 2025; Pham et al., 2023). Among these, injury related anxiety and lack of motivation emerge as particularly influential psychological constraints (Duyan et al., 2025). Economic barriers further shape participation decisions, especially for athletes who require specialized equipment, as insufficient funding and limited accessible infrastructure continue to restrict opportunities for engagement (Declerck et al., 2021; Mcloughlin et al., 2017). Restricted access to facilities, financial costs, transportation barriers, social stigma, and weak policy support are consistently reported as major obstacles limiting participation opportunities for athletes with disabilities in adaptive sports (Chen et al., 2024; Jaarsma et al., 2014).

Alongside the growing recognition of adaptive sports, scientific publications in this field have demonstrated a substantial upward trajectory. Bibliometric analyses show that research has expanded steadily since 2001, with dominant emphases on rehabilitation, health promotion, and social participation (Liu et al., 2022; Adaptado et al., 2023). However, despite this quantitative growth, the intellectual integration of research addressing social support and participation barriers remains underdeveloped and conceptually fragmented. Existing studies frequently prioritize individual psychological or clinical perspectives, while structural participation barriers and their interaction with social support systems are often examined in isolation. Consequently, the field lacks a systematic mapping that clarifies how psychosocial and structural dimensions intersect and how such integration may inform inclusive physical education practices. This unresolved fragmentation underscores a critical knowledge gap that warrants comprehensive bibliometric investigation.

To date, no bibliometric study has systematically mapped the intersection between social support and participation barriers in adaptive sports while explicitly examining its implications for inclusive physical education. Previous bibliometric analyses in adapted sports had primarily focused on rehabilitation, performance outcomes, or general participation trends, leaving insufficient attention to the structural integration of psychosocial support systems and contextual constraints. This gap limits a comprehensive understanding of how adaptive sport research can inform policy development and inclusive educational practice.

Bibliometric analysis is considered a relevant methodological approach for mapping the development of research on social support and barriers in adaptive sports. This approach enables the identification of publication trends, relationships among research topics, and the formation of both dominant and underexplored research clusters, thereby providing a comprehensive overview of the structure and dynamics of a given scholarly field (Aria et al., 2017; Van-Eck et al., 2010).

Therefore, this study aimed to map publication trends on social support and participation barriers in adaptive sports from 2015 to 2025, analyze patterns of international collaboration and citation networks, identify dominant thematic clusters through keyword co-occurrence analysis, and interpret the implications of these findings for strengthening inclusive physical education.

METHODS

This study adopted a bibliometric approach. Bibliometrics is a quantitative method used to examine scientific literature by analyzing publication and citation data in order to identify research patterns, trends, and the evolution of a specific scholarly field (Donthu et al., 2021).

Search Strategies

Data were retrieved from the Scopus database due to its multidisciplinary coverage and structured citation indexing suitable for bibliometric analysis. A phrase-based search was conducted on December 31, 2025, covering publications within the time frame 2015–2025. The search string applied was: ("athletes with disabilities" OR "disabled athletes" OR "para-athletes" OR "paralympic athletes") AND ("social support" OR "perceived social support") AND (barriers OR challenges OR constraints) AND ("adaptive sport" OR "adapted sport" OR "parasport" OR "disability sport"). The initial search yielded 142 records.

Inclusion and Exclusion Criteria

Predefined inclusion and exclusion criteria were applied during the screening and eligibility stages.

Table 1. Inclusion and Exclusion Criteria

Inclusion Criteria	Inclusion	Exclusion
Article Titles and Research Focus	Articles that explicitly examine social support and barriers in adaptive sports among athletes with disabilities	Articles with titles or headings that are not relevant to the research focus
Publication Year	Articles published between 2015 and 2025	Articles published outside the specified time range
Publication Type	Peer-reviewed journal articles published in final form	Editorials, non-systematic review articles, or non-peer-reviewed manuscripts
Language	English language	Languages other than English
Accessibility	Articles with full-text access	Articles available only in preview form or lacking full-text access
Study Context	Studies addressing social support and barriers in adaptive sports among athletes with disabilities	Studies not relevant to the research focus

Data Collection Procedure

The article selection process followed a structured procedure adapted from the PRISMA framework (Page et al., 2021). In the identification phase, 142 records were retrieved from the Scopus database. During the screening stage, records were filtered based on publication year (2015–2025), document type (peer-reviewed journal articles), and language (English), resulting in the exclusion of non-eligible records such as editorials, conference papers, and non-English publications.

In the eligibility phase, full-text articles were assessed to ensure direct relevance to the research focus on social support and participation barriers in adaptive sports for athletes with

disabilities. Articles that addressed adaptive sport broadly without explicitly examining either social support or participation barriers were excluded. Following the screening and eligibility assessment, 71 articles met all inclusion criteria and were included in the final bibliometric analysis. The overall selection procedure is illustrated in Figure 1.

Bibliometric Indicators and Analysis

This study employed several bibliometric indicators, including publication trends, citation counts, co-authorship networks, keyword co-occurrence, and co-citation analysis (Donthu et al., 2021). Network visualization and mapping procedures were conducted using VOSviewer software (Van-Eck et al., 2010). Keyword co-occurrence analysis was used to identify thematic structures and emerging research topics within the field (Van-Eck et al., 2010; Yamin et al., 2023). Co-authorship analysis examined patterns of scholarly collaboration and network structures among researchers (Jaramillo et al., 2023). Citation and co-citation analyses were conducted to determine influential publications and to map the intellectual structure of research in adaptive sports (Donthu et al., 2021). Frequently interconnected references may form thematic clusters that provide insight into evolving knowledge patterns within a research domain (Wen et al., 2020).

Bibliometric Analysis Tools

The analytical tools used in this study included Microsoft Excel, VOSviewer, and Scopus Analytics. Microsoft Excel was utilized for data preprocessing, including cleaning, organizing, and verifying bibliographic records retrieved from the Scopus database. VOSviewer was employed to conduct bibliometric mapping and network visualization, including analyses of keyword co-occurrence, co-authorship networks, citation analysis, and bibliographic coupling among publications. In addition, Scopus Analytics was used to obtain citation metrics and publication statistics that support the identification of influential publications, country-level research contributions, and the overall scholarly impact within the dataset.

Limitations

The analysis was confined to publications indexed in the Scopus database, incorporating only English-language articles published between 2015 and 2025.

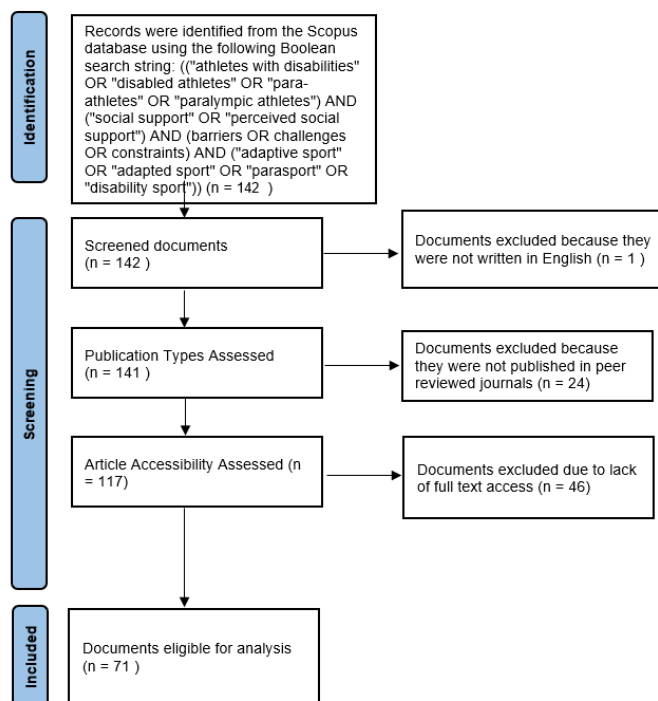


Figure 1. The Article Search and Selection Process

RESULT

The final dataset comprised 71 peer-reviewed journal publications published between 2015 and 2025. Collectively, these publications accumulated a total of 628 citations, with an average of 8.85 citations per document. The dataset achieved an h-index of 16 and a g-index of 23, indicating a moderately concentrated citation distribution in which a subset of influential publications contributed disproportionately to the overall scholarly impact of the field. These bibliometric indicators provide a structured quantitative overview of the intellectual consolidation and developmental trajectory of research on social support and participation barriers in adaptive sports.

1. Publication Growth and Temporal Distribution (2015-2025)

Based on the English-language Scopus database, the number of publications during the early period from 2015 to 2021 remained relatively low and fluctuated. However, a significant increase in publication output has been observed since 2022.

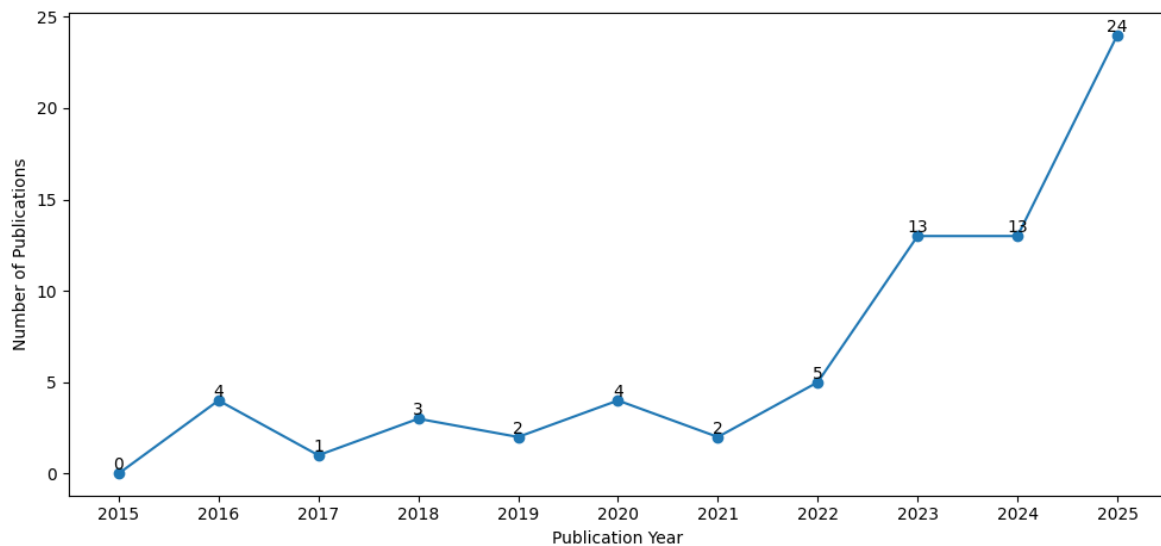


Figure 2. Trends in Research Publications within 2015-2025

A total of 71 peer-reviewed articles met the inclusion criteria for bibliometric analysis. Publication output during the early phase (2015–2021) remained relatively modest and fluctuating, with annual production ranging between 3 and 7 articles per year. In contrast, a substantial acceleration occurred after 2022. Between 2022 and 2025, 45 articles were published, accounting for 63% of the total dataset (45/71). The highest annual output was recorded in 2025, with 24 publications (33.8% of the entire dataset). This sharp increase indicates a recent surge of scholarly attention toward the intersection of social support and participation barriers in adaptive sports.

The temporal distribution suggests that the field has entered an expansion phase rather than a mature stabilization stage. The concentration of publications in the most recent four years reflects intensified global discourse on inclusivity, disability rights, and social participation in sports.

2. Geographic Distribution and Collaboration Network Structure

Table 2 presents the distribution of publications, citation counts, and Total Link Strength (TLS) across countries represented in the analyzed bibliometric dataset.

Table 2. Study Distributions by Country of Publications

Country	Documents	Citations	Total Link Strength
Spain	10	59	70
Portugal	3	3	46
Canada	7	180	44
United States	8	144	43
Turkey	6	14	40
Germany	3	55	37
Italy	4	17	34
Switzerland	3	58	34
United Kingdom	9	114	22
Norway	3	19	15
Saudi Arabia	4	13	15
China	3	30	10
Indonesia	3	8	4
Brazil	3	29	3
Poland	3	3	1

Before applying any minimum document threshold, a total of 42 countries were identified within the dataset. To enhance structural clarity and ensure interpretability of the collaboration network, a minimum threshold of three documents per country was applied, resulting in 15 countries meeting the inclusion criteria for visualization. In the network map, node size represents the number of publications produced by each country. Link thickness indicates the strength of collaborative ties (Total Link Strength), while spatial proximity reflects the intensity of co-authorship relationships.

Based on the bibliometric analysis, more than half of the total publications originated from European and North American countries, indicating a clear geographical concentration of knowledge production. Spain led in document count (10 publications), while Canada (180 citations across 7 documents) and the United States (144 citations across 8 documents) demonstrated higher citation impacts relative to their publication volume. This pattern suggests that scientific influence is not solely determined by output quantity but also by network centrality and citation resonance within the field.

Total Link Strength (TLS) values further reveal structural inequality in the international collaboration network. Spain (TLS = 70), Canada (TLS = 44), and the United States (TLS = 43) function as core nodes within the collaboration structure, whereas countries such as Indonesia (TLS = 4) and Poland (TLS = 1) occupy peripheral positions with limited cross-national connectivity.

As illustrated in Figure 3, Indonesia occupies a peripheral position within the collaboration network map. The Indonesian node is relatively small and exhibits limited connectivity compared with countries located at the core of the network. This peripheral status reflects comparatively weak integration into dominant international collaboration clusters. Although research participation exists, the low TLS value indicates limited structural influence within

the global research network on adaptive sports, highlighting opportunities for strategic international partnerships to enhance both visibility and scholarly impact.

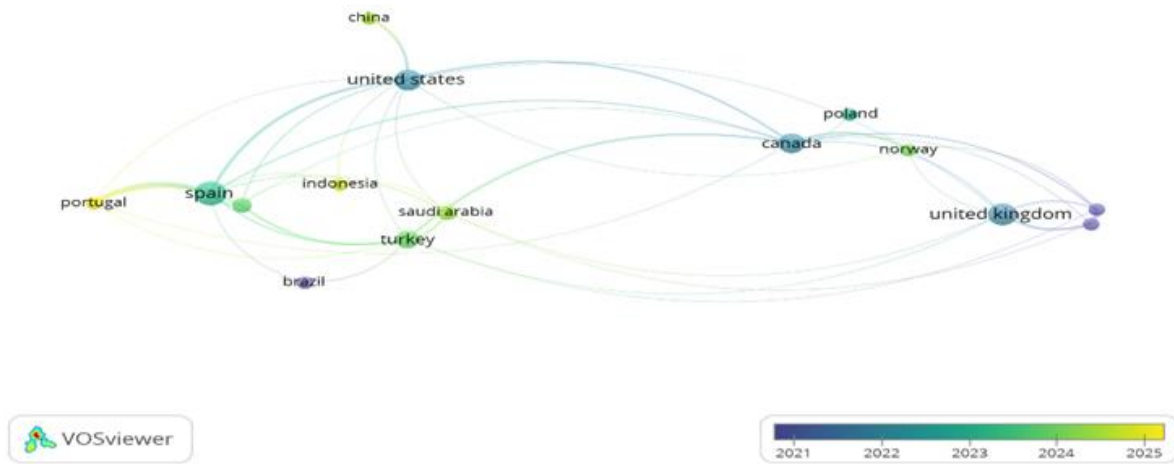


Figure 3. Country Collaboration Networks

3. Analysis of Keyword Co-Occurrence and Thematic Clusters

A total of 240 unique author keywords were identified in the dataset. Keyword co-occurrence analysis was conducted using a minimum occurrence threshold of three appearances per keyword, resulting in 17 keywords included in the final network visualization. Larger nodes represent higher keyword frequency, while shorter distances between nodes indicate stronger conceptual relationships within the research structure.

Keyword co-occurrence analysis conducted using VOSviewer identified four major clusters representing the directions and focal areas of research on social support and barriers in adaptive sports for athletes with disabilities, as illustrated in Figure 4.

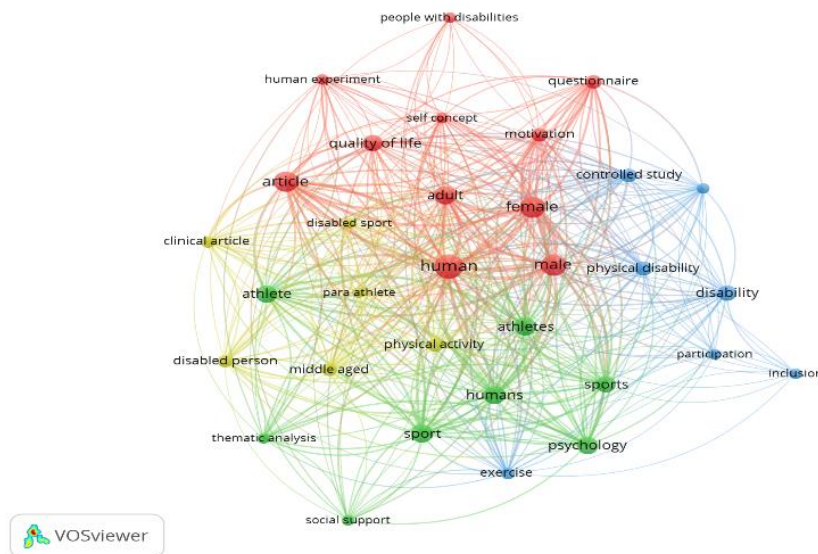


Figure 4. Bibliometric Analysis of Keywords

Based on the results of the analysis, the four identified clusters are interconnected, as shown in Table 3.

Table 3. Thematic Clusters and Dominant Author Keywords

Cluster	Dominan Keywords	Thematic Focus
Cluster 1	<i>quality of life, motivation, self concept, questionnaire, people with disabilities</i>	Psychosocial aspects and quality of life of athletes with disabilities in adaptive sports
Cluster 2	<i>athlete, athletes, sport, sports, psychology, social support</i>	The role of social support and psychological factors in participation in adaptive sports
Cluster 3	<i>disability, physical disability, participation, inclusion, exercise</i>	Structural barriers, inclusivity, and access to participation for athletes with disabilities
Cluster 4	<i>disabled person, disabled sport, para athlete, physical activity, clinical article</i>	Clinical and rehabilitative approaches in adaptive sports

Description of Thematic Clusters

Cluster 1

The first cluster is dominated by keywords such as quality of life, motivation, self concept, questionnaire, and people with disabilities. This cluster represents a research focus on the psychosocial aspects of athletes with disabilities, particularly how social support, motivation, and self perception contribute to quality of life and subjective experiences in adaptive sports.

Cluster 2

The second cluster includes keywords such as athlete, athletes, sport, sports, psychology, and social support. This cluster reflects psychological and social approaches within the context of adaptive sports, emphasizing the role of social support as a key factor influencing participation, engagement, and psychological well being among athletes with disabilities.

Cluster 3

The third cluster focuses on disability and participation related aspects, as indicated by the presence of keywords such as disability, physical disability, participation, inclusion, and exercise. This cluster reflects scholarly attention to issues of inclusivity, access, and structural barriers that influence the involvement of athletes with disabilities in sport related activities.

Cluster 4

The fourth cluster is associated with clinical contexts and groups of athletes with disabilities, as indicated by keywords such as disabled person, disabled sport, para athlete, physical activity, and clinical article. This cluster indicates that a portion of the literature

remains oriented toward medical and rehabilitative approaches, particularly in the context of developing adaptive sports for athletes with disabilities.

Table 4 presents the ten publications with the highest citation counts in studies on social support and barriers in adaptive sports for athletes with disabilities, based on the analyzed dataset.

Table 4. The Ten Most Cited Publications in The Analyzed Dataset

Authors	Title	Journal	Citation
(Evans et al., 2018)	<i>Integrating insights from the parasport community to understand optimal experiences: The Quality Parasport Participation Framework</i>	<i>Psychology of Sport and Exercise</i>	94
(Arbour-nicitopoulos et al., 2018)	<i>A Scoping Review of Inclusive Out-of-School Time Physical Activity Programs for Children and Youth with Physical Disabilities</i>	<i>Adapted Physical Activity Quarterly</i>	43
(Powell et al., 2017)	<i>Developing Mental Toughness: Lessons from Paralympians</i>	<i>Frontiers in Psychology</i>	42
(Lochbaum et al., 2022)	<i>The Athletic Identity Measurement Scale (AIMS): A Systematic Review</i>	<i>European Journal of Investigation in Health, Psychology and Education</i>	34
(Klenk et al., 2019)	<i>Social participation of people with disabilities in organized community sport</i>	<i>German Journal of Exercise and Sport Research</i>	28
(Albrecht et al., 2019)	<i>Sports Clubs as a Medium for Integrating People with Disabilities</i>	<i>European Journal for Sport and Society</i>	25
(Yang et al., 2024)	<i>Factors Influencing Sports Performance among Athletes with Disabilities: A Systematic Review</i>	<i>Heliyon</i>	24
(Barak et al., 2016)	<i>Psychosocial Effects of Competitive Boccia Programs on Persons with Severe Physical Disabilities</i>	<i>Journal of Rehabilitation Research and Development</i>	23
(Sakalidis et al., 2023)	<i>The role of the social environment in inclusive sports participation—Identifying similarities and challenges in athletes with and without Intellectual Disabilities through coaches’ eyes: A qualitative inquiry</i>	<i>PLOS ONE</i>	23
(Haiachi et al., 2016)	<i>Reflections on the Athletic Career of Brazilian Paralympic Athletes</i>	<i>Ciência & Saúde Coletiva</i>	20

These publications represent some of the most influential works contributing to the development of academic discourse on the roles of social support, environmental and psychosocial factors, as well as various structural and personal barriers encountered by athletes with disabilities in adaptive sport participation and performance. The high citation counts indicate that these studies serve as key references shaping the direction of adaptive sport research and demonstrate strong relevance for the advancement of policy development, training practices, and support based interventions for athletes with disabilities.

4. Author and Country Collaboration Analysis (Co-Authorship)

Co-authorship analysis was performed to examine patterns of international scholarly collaboration within the dataset. A minimum threshold of two documents per country was applied to ensure inclusion of countries with sustained research activity while maintaining network clarity. Out of the 42 countries identified in the dataset, nine met this criterion and were included in the final co-authorship visualization. In the network map, nodes represent countries, while node size corresponds to the number of co-authored publications. Link thickness reflects the strength of collaborative ties (Total Link Strength) and spatial proximity indicates the intensity of co-authorship relationships between countries. The results of the co-authorship analysis indicate that academic collaboration in research on social support and barriers in adaptive sports for athletes with disabilities remains limited and tends to be fragmented. The collaboration network involves nine countries distributed across four clusters, with relatively low levels of intercountry connectivity.

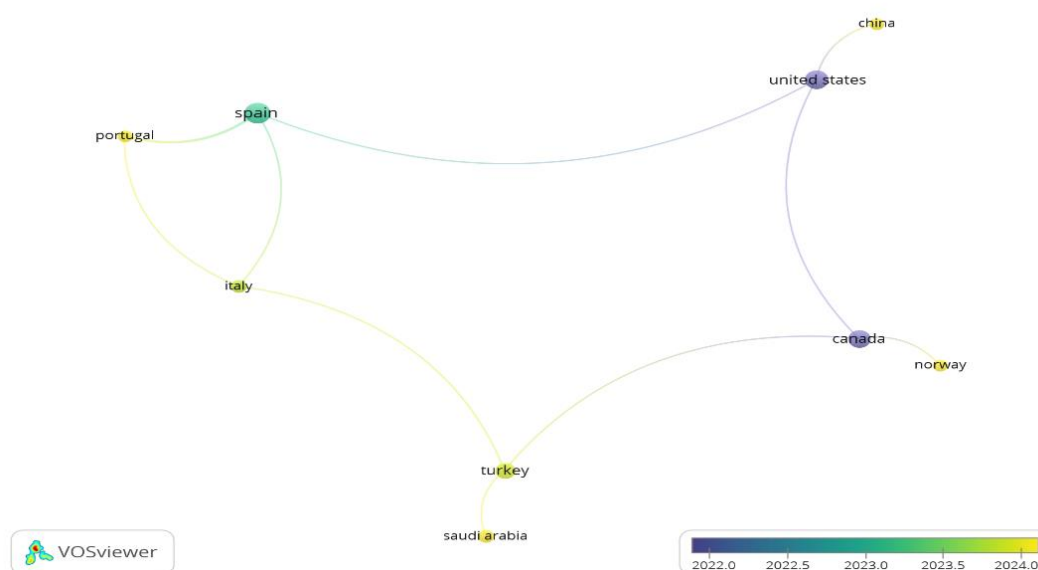


Figure 5. Academic Collaboration in Research Based on Author Countries

The United States and Canada occupy relatively central positions within the collaboration network and function as connectors across clusters. Western European countries such as Spain, Portugal, and Italy form a distinct collaboration cluster, whereas Turkey and Saudi Arabia exhibit more limited collaboration patterns. Overall, these findings indicate substantial opportunities to strengthen international collaboration in order to enhance the integration and advancement of adaptive sports research for athletes with disabilities.

5. Citation Analysis and Bibliographic Coupling

Citation network analysis was conducted to identify structurally influential publications within the dataset. A minimum citation threshold of five citations per document was applied to highlight documents with measurable scholarly impact while preserving network interpretability. Based on this criterion, eight publications met the threshold and were included in the citation network visualization. In this network structure, nodes represent individual documents, node size reflects citation frequency, and link strength indicates bibliographic coupling relationships based on shared references.

Document citation analysis reveals that the majority of publications addressing social support and barriers in adaptive sports for athletes with disabilities still exhibit relatively low citation levels. This finding indicates limited exposure and insufficient integration of this research within the global academic network. However, a smaller number of highly cited articles primarily focus on psychosocial aspects, social environments, and factors that support or hinder participation and performance among athletes with disabilities, suggesting that these themes attract broader academic interest.

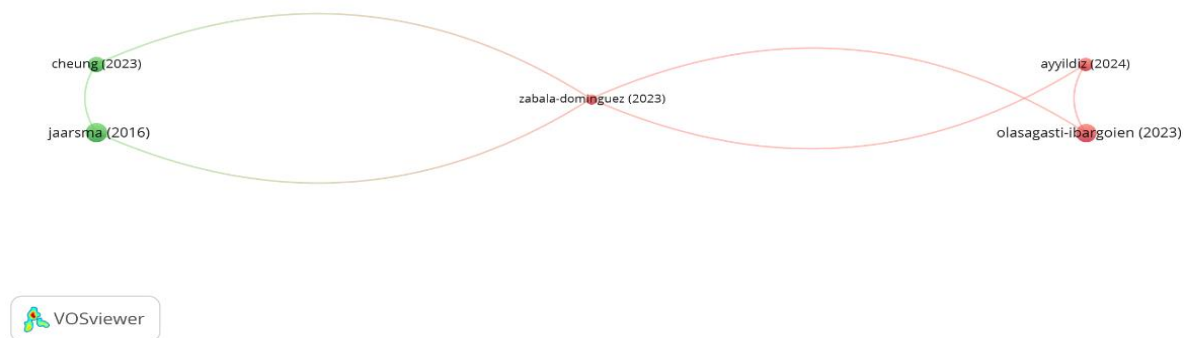


Figure 6. Document Citations

Furthermore, bibliographic coupling analysis revealed the formation of two main clusters of articles interconnected through shared reference patterns. The first cluster is dominated by more recent publications focusing on social support and the participation experiences of athletes with disabilities in adaptive sports. The second cluster includes earlier publications that emphasize structural barriers and environmental contexts in the development of adaptive sports. This pattern indicates the presence of distinct thematic orientations across article groups, although the degree of interconnectedness between clusters remains relatively limited.

DISCUSSION

The results of the bibliometric analysis reveal a pattern of research development that not only reflects an increase in publication volume, but also demonstrates epistemological

directions and thematic fragmentation within adaptive sport research. These findings provide an important basis for interpreting how social support and participation barriers are positioned within the literature, as well as their implications for inclusive physical education.

1. Interpretation of Thematic Clusters and Research Patterns

The bibliometric configuration identified in this study indicates not merely thematic diversification, but a transformation in the conceptual orientation of adaptive sport research. The prominence of psychosocial constructs suggests that disability sport scholarship has increasingly shifted toward individual-centered explanatory models. This trajectory aligns with broader conceptual developments that frame disability sport within social and participatory paradigms rather than as exclusively medical or rehabilitative domains (Elipe-Lorenzo et al., 2025; Mira et al., 2023).

However, the structural separation observed between psychosocial themes and structural participation barriers indicates that conceptual integration remains limited. Structural determinants such as institutional accessibility, policy frameworks, and organizational governance are acknowledged within the literature (Declerck et al., 2021; Oldorp et al., 2025), yet they are only weakly interconnected with psychological constructs in citation and keyword networks. This fragmentation suggests that adaptive sport scholarship, despite expanding its thematic scope, continues to operate predominantly at the individual explanatory level rather than through integrated socio-ecological frameworks.

When compared with prior bibliometric analyses, the present findings refine existing understandings of adapted sport research. The study mapping research trends of adapted sports from 2001 to 2020 (Liu et al., 2022) identified rehabilitation and health-promotion paradigms as dominant orientations across two decades of adapted sport scholarship. Similarly, a study on adapted sports using a bibliometric analysis (Adaptado et al., 2023) documented broad thematic expansion without isolating the interaction between social support and participation barriers. In contrast, the present study demonstrates that although psychosocial research has gained prominence, its integration with structural inclusion remains conceptually fragmented. Thus, the contribution of this analysis lies in exposing not only thematic growth but also epistemological discontinuities within the field.

2. Interdisciplinary Gaps and Limited Cluster Connectivity

The limited connectivity among thematic clusters observed in this study reflects disciplinary segmentation within adaptive sport research. Psychosocial investigations emphasizing well-being and social support (Mira et al., 2023), clinical and technological orientations centered on rehabilitation and performance (De Luigi et al., 2014), and participation-focused analyses addressing barriers and facilitators (Liu et al., 2025) represent distinct strands of inquiry within the broader field. The weak bibliometric coupling identified in this analysis suggests that these strands remain structurally under-integrated rather than consolidated within a unified interdisciplinary framework. This structural pattern indicates that adaptive sport scholarship has yet to fully integrate athlete-level experiences with systemic institutional conditions.

Such segmentation may restrict theoretical advancement. Without consistent integration between psychosocial constructs and structural participation determinants, the research risks generating isolated explanatory models confined either to individual adaptation or to contextual constraint. Strengthening interdisciplinary dialogue across sport psychology,

disability studies, public health, and educational policy research is therefore essential for fostering a more coherent and integrative knowledge structure.

3. Implications for Physical Education and Global Curriculum

The intellectual configuration of the literature suggests that inclusive physical education should not be conceptualized merely as instructional adaptation, but as a systemic environment in which psychosocial support and structural accessibility interact. Rather than positioning teachers solely as motivators, inclusive practice requires alignment between pedagogical design, institutional infrastructure, and policy coherence (Bailey et al., 2009; Haegele et al., 2021). Within this perspective, adaptive sports can function as a structured mechanism for fostering belonging, identity affirmation, and equitable participation when embedded within coherent institutional frameworks (Schwartz et al., 2023).

Despite growing thematic diversification, pedagogical and policy-oriented dimensions of adaptive sports appear less central within the bibliometric network structure identified in this study. Much of the existing scholarship continues to privilege psychological and clinical analyses (De-Luigi et al., 2014; Mira et al., 2023), while research situated in physical education contexts frequently emphasizes instructional innovation and implementation-level dynamics, such as media-based intervention studies (Pratiwi 2019) and evaluative analyses of adapted physical education practice (Burhaein et al., 2024), rather than broader systemic institutional design. This structural imbalance underscores the necessity of repositioning physical education not merely as a delivery context, but as an institutional arena in which structural inclusion and psychosocial empowerment are systematically integrated (Schwartz et al., 2023).

Within the context of global curricula that emphasize inclusive education and social justice, adaptive sports may be positioned as a strategic instrument for cultivating values of empathy, diversity, and respect for difference (Bailey et al., 2019). The integration of adaptive sports into physical education holds the potential to institutionalize social support, particularly through the role of teachers and instructional design, while policy support functions as a key structural enabler (Haegele et al., 2021). Furthermore, the development of physical education based on adaptive sports aligns with global education agendas oriented toward Education for Sustainable Development (United Nations Educational 2015), particularly in advancing equitable access to education and reducing inequalities. Accordingly, the findings of this study emphasize the importance of positioning adaptive sports and social support as integral components of physical education policy and practice at both national and global levels.

4. Identification of Research Gaps and Future Research Directions

Thematic synthesis based on the results of the bibliometric analysis reveals several critical gaps in the literature on social support and barriers in adaptive sports for athletes with disabilities. First, existing studies remain largely dominated by individual psychological approaches, in which social support is primarily conceptualized as subjective perception or a motivational factor at the athlete level. In contrast, the role of social support within institutional frameworks such as sport policies, inclusive physical education systems, and adaptive sports organizations has received comparatively limited scholarly attention.

Second, limited interdisciplinary integration is evident in the minimal connection between sport psychology research and studies addressing structural barriers, including accessibility, inclusivity, and the governance of disability sports. Structural barriers and social support are

often examined separately, resulting in an incomplete understanding of their interconnected influence on the experiences and participation of athletes with disabilities.

Third, the existing literature is predominantly shaped by perspectives from developed countries, while studies grounded in the socio-cultural contexts of developing countries remain scarce. As a result, current understandings of social support and barriers in adaptive sports do not fully reflect the diversity of policy environments, inclusive physical education systems, and sport practices across different regions, including Indonesia.

Fourth, the relatively low level of intercountry connectivity within publication networks suggests that research on adaptive sports for athletes with disabilities has not yet been strongly integrated into global academic discourse. This pattern highlights the need to strengthen cross national collaboration and broaden global perspectives to promote a more comprehensive development of research on social support and barriers in adaptive sports.

In light of these gaps, future research should prioritize integrative approaches that connect social support, structural barriers, and policy contexts in physical education and adaptive sports. However, given the bibliometric evidence of weak connectivity between psychosocial and structural clusters identified in this study, more systematic methodological advancement is required. Future investigations should adopt multi-level analytical designs that integrate athlete-level psychosocial constructs with institutional accessibility indicators and governance variables. The application of socio-ecological frameworks may enable researchers to examine how support mechanisms operate across individual, institutional, and policy levels simultaneously. Furthermore, longitudinal and mixed-method approaches would allow scholars to assess how structural interventions influence perceived social support and participation trajectories over time, thereby strengthening theoretical consolidation within adaptive sport research.

5. Study Limitations

This study has several limitations. The analysis was restricted to English language publications indexed in the Scopus database, excluding local language literatures and national publications that may better reflect the social, cultural, and policy contexts of adaptive sports in developing countries, including Indonesia. In addition, this bibliometric study is descriptive in nature and focuses on patterns of keyword relationships and publication networks. Consequently, it does not provide an in depth examination of the conceptual frameworks, theoretical approaches, or empirical contexts employed within individual studies.

CONCLUSION

The present bibliometric mapping demonstrates that research on social support and participation barriers in adaptive sports has expanded substantially over the past decade, yet it remains conceptually fragmented. Although psychosocial dimensions have gained increasing prominence, structural and institutional determinants are only weakly interconnected within the existing knowledge network. This imbalance reflects a predominantly individual-centered explanatory orientation that limits comprehensive understanding of how policy, infrastructure, and governance contexts shape the athlete experiences in adaptive sports.

By identifying four major thematic clusters and revealing limited connectivity between psychosocial and structural domains, this study clarifies an unresolved structural–conceptual

gap within adaptive sport scholarship. Furthermore, the concentration of research production in Europe and North America, alongside relatively low intercountry collaboration, indicates that the field has not yet fully incorporated diverse socio-cultural and educational contexts.

Building upon the bibliometric evidence of thematic fragmentation and weak inter-cluster integration identified in this study, future research should adopt multi-level analytical frameworks that integrate athlete-level psychosocial constructs with institutional accessibility, governance systems, and educational policy environments. Empirical investigations applying socio-ecological models, longitudinal designs, and mixed-method approaches are particularly necessary to examine how structural conditions influence perceived social support and long-term participation trajectories. Expanding cross-national collaboration and strengthening research representation from developing countries will be essential to produce more globally representative and policy-relevant knowledge capable of informing inclusive physical education systems and equitable adaptive sport participation.

AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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