Uluslararası Avrasya Sosyal Bilimler Dergisi / *The International Journal of Eurasia Social Sciences*
Cilt/Volume: 16, Sayı/No: 62, Yıl/Year: 2025, ss. / pp.: 2634-2657
E-ISSN: 2146-1961
URL: https://rrpubs.com/index.php/ijoess

The role and structural analysis of mindfulness-related publications in exercise and sport psychology research from a bibliometric perspective

Zeynep Ayça TERZİOĞLU[1], Nazmi BAYKÖSE[2]

[1]Antalya Bilim University, School of Civil Aviation, Antalya, Turkiye
[2]Akdeniz University, Faculty of Sport Sciences, Antalya, Turkiye

Derleme Makale/ *Review*		**DOI:** 10.70736/ijoess.2187
Gönderi Tarihi/ *Received:*	Kabul Tarih/ *Accepted:*	Online Yayın Tarihi/ *Published*:
11.08.2025	29.11.2025	01.12.2025

Abstract

In recent years, mindfulness has become an increasingly prominent research topic in sports science. The purpose of this study is to investigate the status of mindfulness-related research within the domains of sport, exercise, and physical activity using a bibliometric approach. Data were collected from the Web of Science database on 13 April 2025 through a systematic search using the keywords "mindfulness" AND "sport" OR "exercise" OR "physical activity", and include publications from 2004 to 2025. A total of 422 documents were retrieved, and the data were analyzed and visualized using the Biblioshiny package in the R Studio environment. The results indicated that the *Mindfulness* journal published the largest number of studies on this topic. According to the analysis, the United States was the leading country in terms of publication output, while China stood out in international co-authorships. Among the authors, Ullrich-French S. had the highest number of publications, and Fournier J.F. received the most citations. Overall, findings indicate that mindfulness is a relatively new but rapidly growing area in sport and exercise psychology, with the 2024 publication surge reflecting rising scholarly interest. This research enhances the field by mapping mindfulness studies in sport and exercise psychology and offering guidance for future investigations.

Keywords: Bibliometrics, Exercise, Mindfulness, Physical Activity, Sport

Bibliyometrik perspektiften egzersiz ve spor psikolojisi araştırmalarında farkındalık konulu yayınların rolü ve yapısal analizi

Öz

Son yıllarda farkındalık kavramı, spor bilimleri alanında giderek artan bir araştırma konusu haline gelmiştir. Bu çalışma, spor, egzersiz ve fiziksel aktivite alanlarında farkındalık konulu araştırmaların literatürdeki konumunu bibliyometrik yöntemle incelemeyi amaçlamaktadır. Araştırmanın verileri, 13 Nisan 2025 tarihinde Web of Science veri tabanında gerçekleştirilen sistematik bir tarama ile elde edilmiştir. Taramada "Mindfulness" AND "Sport" OR "Exercise" OR "Physical Activity" anahtar kelimeleri kullanılmış ve 2004–2025 yılları arasında yayımlanan akademik çalışmalar analize dâhil edilmiştir. Toplam 422 dokümana ulaşılmış; elde edilen veriler R Studio ortamında Biblioshiny paketi kullanılarak analiz edilmiş ve görselleştirmeler yapılmıştır. 2004–2025 yılları arasında spor ve egzersiz psikolojisi bağlamında farkındalık konusuna en fazla yer veren dergi Mindfulness dergisidir. Analiz sonuçlarına göre, en fazla yayının Amerika Birleşik Devletleri tarafından üretildiği, uluslararası ortak yayınlarda Çin'in öne çıktığı belirlenmiştir. Yazar analizleri incelendiğinde, Ullrich-French S. yayın sayısı açısından, Fournier J. F. ise atıf sayısı bakımından öne çıkan isimlerdir. Bulgular, farkındalık kavramının spor, egzersiz ve fiziksel aktivite literatüründe görece yeni ancak hızla gelişen bir araştırma alanı olduğunu göstermektedir. 2024 yılındaki yayın artışı, bu alana yönelik akademik ilginin yükselişini göstermektedir. Çalışma, farkındalığın spor ve egzersiz psikolojisindeki konumunu ortaya koyarak alanyazına katkı sunmakta ve gelecekteki araştırmalara yön vermektedir.

Anahtar Kelimeler: *Bibliyometri, Egzersiz, Farkındalık, Fiziksel Aktivite, Spor*

This research was presented as a verbal paper at the 8th International Congress of Exercise and Sports Psychology Congress.

Sorumlu Yazar/ Corresponded Author: Zeynep Ayça TERZİOĞLU, **E-posta/ e-mail:** ayca.terzioglu@antalya.edu.tr

INTRODUCTION

In recent years, mindfulness has garnered increasing attention within sports sciences as an approach to support individuals' physical and psychological well-being (Creswell, 2017; Wang et al., 2023; Rogowska & Tataruch, 2024). Initially rooted in stress management (Kabat-Zinn, 2003), mindfulness is now widely applied in the contexts of sports, exercise, and physical activity. Evidence suggests that it enhances overall athletic performance through mechanisms such as improved focus (Anderson et al., 2021), increased psychological resilience (Liu et al., 2021), heightened flow states, and reduced competitive anxiety (Noetel et al., 2019).

The most widely used definition of mindfulness in the sports sciences is provided by Kabat-Zinn (2003, p. 145), who described it as "*the awareness that arises from paying attention, on purpose, in the present moment, and non-judgmentally.*" Mindfulness began gaining scientific attention in the 1980s through Kabat-Zinn's (1982) development of the Mindfulness-Based Stress Reduction (MBSR) program, which was later adapted for broader applications in modern psychology and health sciences (Baer, 2003; Ludwig & Kabat-Zinn, 2008; Chiesa & Serretti, 2009; Shonin et al., 2013; Crane et al., 2017). Recent reviews and meta-analyses indicate that mindfulness-based interventions positively impact athletes' sports performance, attention, flow, emotion regulation (Xie et al., 2025) and mindfulness (Si et al., 2024; Wang et al., 2023). Furthermore, these interventions contribute to improved mental health by reducing anxiety (Si et al., 2024) and stress (Xie et al., 2025). The literature contains numerous bibliometric analyses on mindfulness across various disciplines (Baminiwatta & Solangaarachchi, 2021; Bunjak et al., 2022; Ferreira & Demarzo, 2024; Sabé et al.,2025). Parallel bibliometric analyses on physical activity and mental health also revealed increasing interest in mind-body exercises such as yoga, tai chi, and qigong (Zhang et al., 2024). In the bibliometric analysis conducted by Birrer et al. (2023), a significant increase in mindfulness-based publications in the context of sports has been reported, particularly after 2015. Bunjak et al. (2022), in their analysis of 18.342 publications, highlighted that although research has predominantly focused on psychology, psychiatry, and neuroscience, there has been a noticeable increase in studies within fields such as public health, education, organizational behavior, and exercise science. Keyword analyses revealed attention, emotion regulation, and self-awareness as prominent themes—concepts closely aligned with performance, anxiety, and self-regulation in sports and exercise psychology. A study examining research themes and the intellectual base of sport and exercise psychology articles using bibliometric methods found that motivation research was particularly prominent between 2008 and 2011 (Lindahl et al.,

2015). In a related study, Coimbra et al. (2022) examined 4.949 articles from ten journals published between 2001 and 2020 in the Web of Science database. Their keyword analysis showed that "physical activity", "motivation", "self-determination theory", and "performance" were the most frequently used terms, with "mindfulness" emerging as a growing theme after 2017. Taken together, these bibliometric findings highlight both the growth of mindfulness research and its gradual integration into sports and exercise contexts. Most existing analyses focus on mental health fields such as psychology and psychiatry (Baminiwatta & Solangaarachchi, 2021; Bunjak et al., 2022), with the primary research groups in these studies concentrating on depression, stress, and anxiety (Wang et al., 2021). Consequently, there is a relative lack of systematic analyses exploring research trends specifically in the context of sports and exercise. Due to this thematic focus, relatively few studies have systematically examined research trends in the context of sports and exercise. Although mindfulness practices and interventions generally show positive effects on physical activity, sport performance, and psychological outcomes, the existing evidence is limited and sometimes inconsistent, highlighting the need for more robust research (Bühlmayer et al., 2017; Schneider et al., 2019). Overall, these results suggest that while mindfulness interventions demonstrate potential efficacy, sport-specific evidence lags behind broader mindfulness research by nearly a decade (Birrer et al., 2023). Therefore, based on these findings, it is evident that a comprehensive examination of mindfulness research within the specific context of exercise and sports psychology is needed. Accordingly, the aim of this study is to investigate the place of mindfulness within the literature on sports, exercise, and physical activity using bibliometric methods, to map the overall landscape, and to provide structural guidance for future research.

METHOD

Bibliometric analysis is essential for mapping the development of research domains, identifying gaps in knowledge production, and guiding future studies (Aria & Cuccurullo, 2017; Donthu et al., 2021). The data used to examine the topic of mindfulness within the context of sport, exercise, and physical activity were obtained from the Web of Science (WoS) Core Collection database. WoS is an interdisciplinary and selective database classified according to indexed content types and thematic areas. The Web of Science Core Collection (WoS CC), which constitutes the foundation of the platform, consists of six main citation indexes: the Science Citation Index Expanded (SCIE), the Social Sciences Citation Index (SSCI), the Arts & Humanities Citation Index (A&HCI), the Conference Proceedings Citation Index (CPCI),

the Book Citation Index (BKCI), and the more recently added Emerging Sources Citation Index (ESCI) (Liu, 2019).

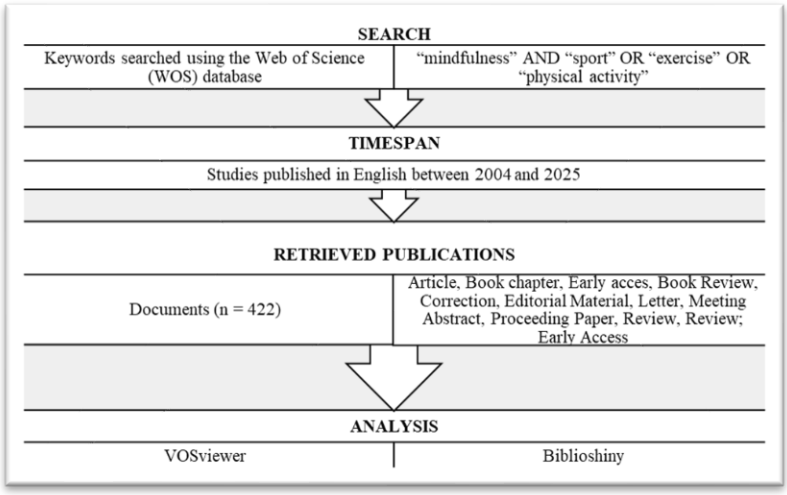

Figure 1. The framework of the study

Data on mindfulness in sport, exercise, and physical activity were retrieved from the Web of Science (WoS) Core Collection on April 13, 2025. Using the SALSA method (Grant & Booth, 2009) and the biblioshiny package in RStudio, 422 English-language documents published between 2004 and 2025 were identified. The search focused on the topic "mindfulness" AND "sport" OR "exercise" OR "physical activity", including articles, book chapters, conference proceedings, and other document types within the Sport and Exercise Psychology category. The framework of the study is presented in Figure 1.

FINDINGS

The retrieved studies were analyzed in terms of journal, year, authors, country, and co-occurring keywords.

Dataset

According to the bibliometric analysis, 422 documents on mindfulness in the context of sport and exercise psychology were identified for the period 2004–2025. Examination of document types indicated that articles were the most represented, with 290 publications. A total of 1.642 authors contributed to the dataset, with 31 studies being single-authored. Descriptive statistics of the analysis are presented in Table 1.

©IJOESS

Table 1. Descriptive statistics

Main Information About Data	Results	Document Types	Results	Document Contents	Results
Timespan	2004:2025	Article	290	Keywords Plus (ID)	791
Sources (Journals, books, etc.)	247	Article; Book chapter	6	Author's Keywords (DE)	826
Documents	422	Article; Early access	4	**Authors Collaboration**	**Results**
Annual Growth Rate %	11.03	Book Review	12	Single-authored docs.	33
Document Average Age	5.33	Correction	2	Co-Authors per doc.	4.81
Average Citations per doc.	13.42	Editorial Material	5	International co-authorships %	18.96
References	12886	Letter	3	**Authors**	**Results**
		Meeting Abstract	71	Authors	1642
		Proceeding Paper	2	Authors of Single-authored docs.	31
		Review	26		
		Review; Early Access	1		

Three-fields plot visualizing the countries and journals associated with the keyword "mindfulness" in the context of sport and exercise psychology are presented in Figure 2.

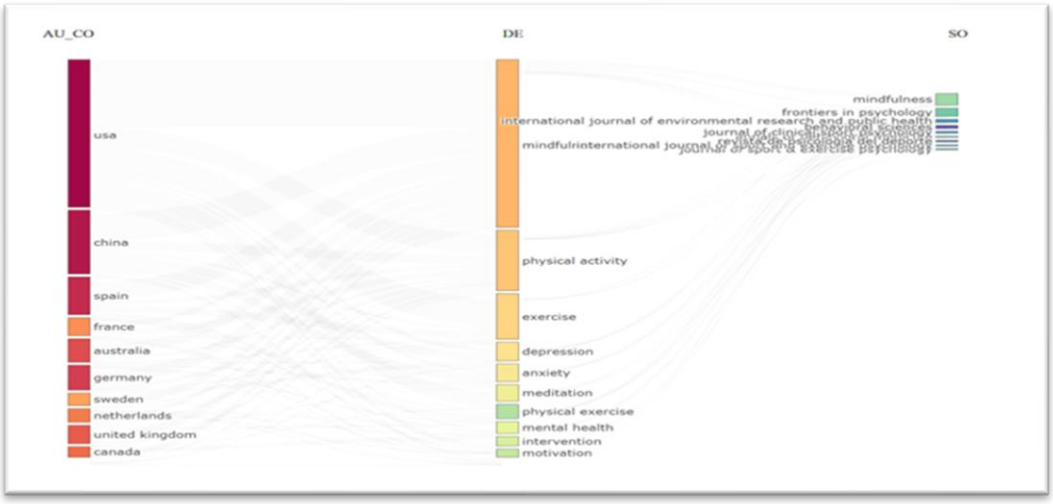

Figure 2. Three-fields plot

In Figure 2, the left field represents the countries with the highest number of publications, the middle field shows the most prominent keywords in the studies, and the right field displays the most influential journals. This three-field plot provides a holistic overview of publications from 2004 to 2025. The top 10 items in each category—keywords, countries, and journals—are highlighted in the analysis. In the context of mindfulness in sport and exercise psychology, publications from 10 different countries were identified, with the United States, China, and

Spain leading in terms of publication count. The most frequently used keywords were "mindfulness", "physical activity", and "exercise". Additionally, the majority of publications featuring the keyword "mindfulness" were produced by authors from the United States, and the journal *Mindfulness* was identified as the most prolific in terms of the number of publications published.

Documents

In scientific research, it is expected that the keywords selected by authors accurately and comprehensively represent the content of their studies. Based on the assumption that keywords reflect publication content, keyword analysis can be employed as a methodological tool to identify research trends, current themes, and the scope of work within a given field. For data collection, the WoS database was utilized. WoS allows for the search of both author-provided keywords and Keywords Plus. Keywords Plus terms are generated by scanning the titles of references cited in indexed publications and extracting frequently used terms and phrases (Reavie, 2009).



Figure 3a. Keywords plus



Figure 3b. Author's keywords



Figure 3c. Article titles

Keywords Plus	
Word	**Frequency**
Meditation	60
Anxiety	42
Depression	42
Health	41
Stress reduction	41
Interventions	39
Intervention	38
Validation	37
Performance	36
Stress	34
Author's Keywords	
Word	**Frequency**
Mindfulness	182
Physical activity	62
Exercise	41
Depression	18
Anxiety	17
Meditation	17
Mental health	14
Intervention	12
Motivation	12
Physical exercise	12
Article Titles	
Word	**Frequency**
Mindfulness	367
Exercise	208
Physical	123
Activity	94
Effects	74
Trial	63
Sport	60
Study	60
Controlled	59
Mindfulness-Based	56

©IJOESS



Figure 3d. Abstract texts

Abstract Texts	
Word	**Frequency**
Mindfulness	1195
Exercise	610
Physical	505
Study	449
Activity	363
Intervention	314
Participants	305
Control	245
Results	240
Training	212

Word frequency distributions in the articles were analyzed using Biblioshiny and visualized as word clouds. Keywords plus analysis showed "Meditation" as the most frequent term (f = 60, Figure 3a), while author keywords highlighted "Mindfulness" (f = 182) and "Physical activity" (f = 62, Figure 3b). In article titles and abstracts, "Mindfulness" was the most prominent term, with frequencies of 367 (Figure 3c) and 1.195 (Figure 3d), respectively.

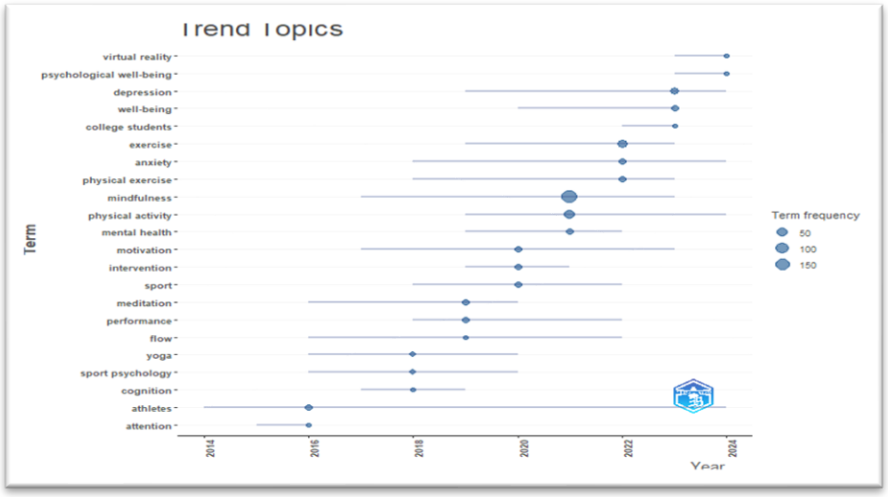

Figure 4. Trends in author keywords

Figure 4 shows the distribution of author keywords in mindfulness research within sport and exercise psychology (2014–2024). "Mindfulness" was the most frequent keyword (f = 182), followed by "physical activity" (f = 62), "exercise" (f = 41), "depression" (f = 18), "anxiety" (f= 17), and "meditation" (f = 17). The term "athletes" first appeared in 2014, while keywords like "mindfulness", "physical activity", and "mental health" increased notably after 2019. Recently (2023–2024), new terms such as "psychological well-being", "virtual reality", and "college students" have emerged, reflecting the diversification of research toward cognitive, emotional, and technological aspects.

©IJOESS

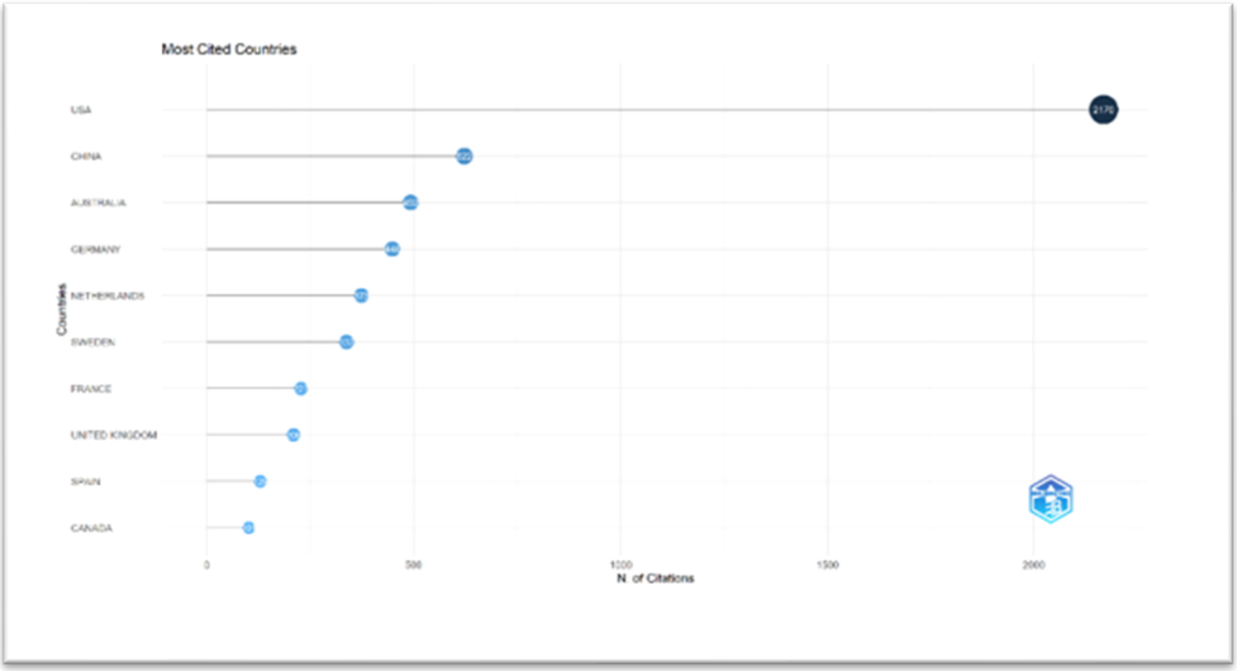

Figure 5. Countries with the highest citation counts (2004–2025)

Citation analysis indicated that the country with the highest number of citations was the United States, with 2.170 citations, followed by China with 622 citations and Australia with 492 citations. The countries with the highest citation counts are presented in Figure 5.

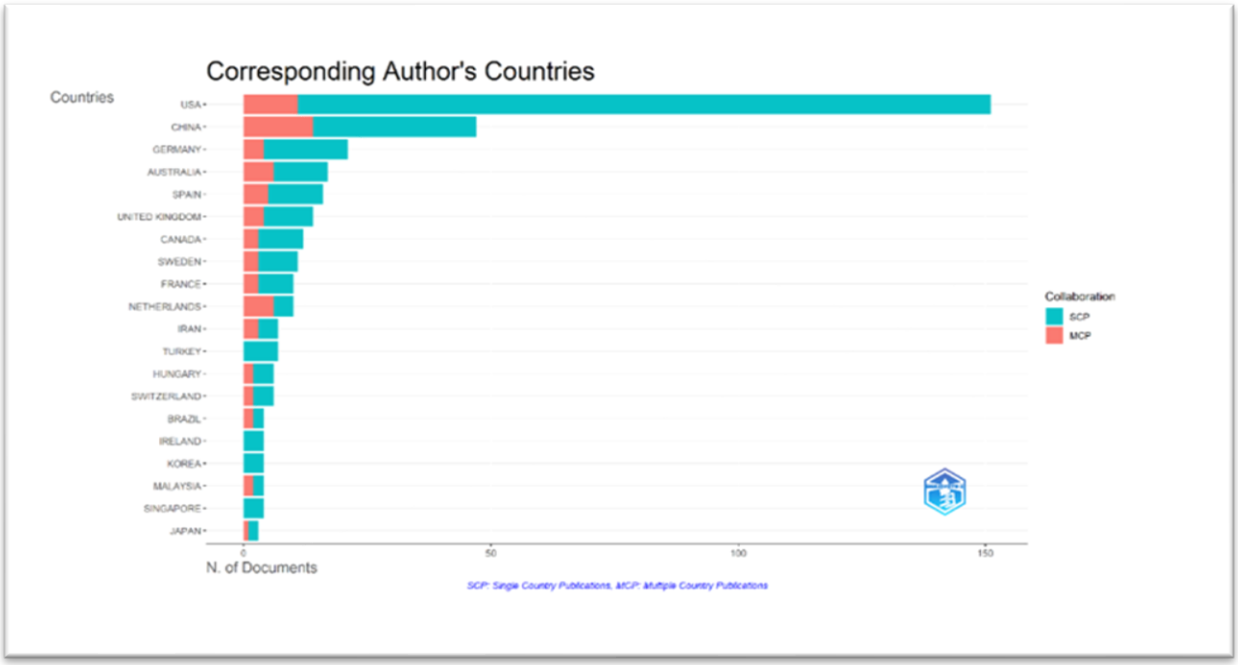

Figure 6. Countries with the highest number of publications (2004–2025)

Figure 6 shows the country distribution of corresponding authors in mindfulness research within sport and exercise psychology. The top 20 countries are ranked by publication count,

distinguishing single-country publications (SCP, green) and multiple-country publications (MCP, red). The United States appears as the leading contributor in terms of total publications, with SCPs highlighted in green, while China is prominent in MCPs, indicated in red.

Sources

The distribution of journals publishing research on mindfulness in sport and exercise psychology was analyzed according to Bradford's Law. As shown in Figure 7 and Table 2, the top 10 most cited articles in this field are located within the core journal zone (Zone 1).

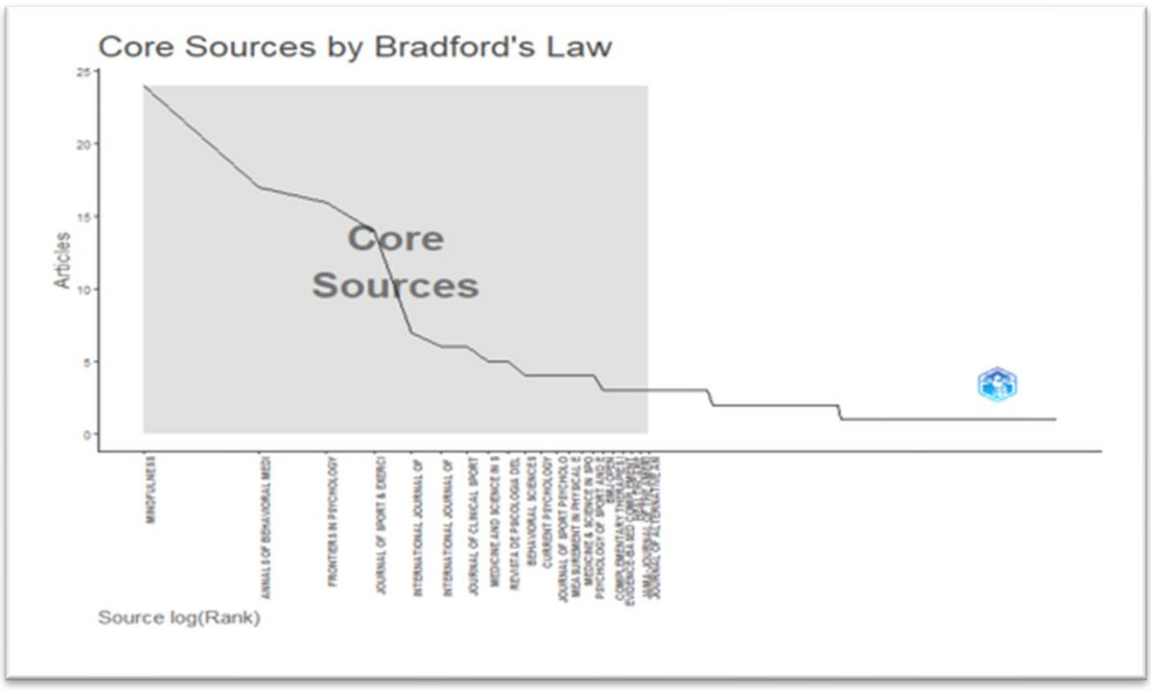

Figure 7. Bradford's law

Among 247 journals, 21 are classified as Zone 1, 87 as Zone 2, and 139 as Zone 3. Although Zone 1 journals represent only 8.5% of all journals, they account for 33.6% of the published studies.

Table 2. Analysis of the articles according to Bradford's Law

Rank	Journal	Number of Publications	Quartile	Publisher	Country	Zone
1	Mindfulness	24	Q1	Springer Verlag	Germany	Zone 1
2	Annals of Behavioral Medicine	17	Q1	Oxford University Press	United States	Zone 1
3	Frontiers in Psychology	16	Q2	Frontiers Media SA	Switzerland	Zone 1

©IJOESS

Rank	Journal	Number of Publications	Quartile	Publisher	Country	Zone
4	Journal of Sport & Exercise Psychology	14	Q2	Human Kinetics	United States	Zone 1
5	International Journal of Sport & Exercise Psychology	7	Q2	Taylor & Francis	Switzerland	Zone 1
6	International Journal of Environmental Research and Public Health	6	Q2	MDPI	Switzerland	Zone 1
7	Journal of Clinical Sport Psychology	6	Q3	Human Kinetics	United States	Zone 1
8	Medicine and Science in Sports and Exercise	5	Q1	Lippincott Williams & Wilkins	United States	Zone 1
9	Revista De Psicologia Del Deporte	5	Q4	Sociedad Revista de Psicología del Deporte	Spain	Zone 1
10	Behavioral Sciences	4	Q2	MDPI	Switzerland	Zone 1

Articles on mindfulness within the context of sport and exercise psychology are published across a wide range of journals, with the 290 retrieved articles originating from 247 different journals. Between 2004 and 2025, the journal publishing the highest number of articles on mindfulness in sport and exercise psychology was *Mindfulness*, published by Springer Verlag, with a total of 24 articles. The *Annals of Behavioral Medicine* published 17 articles, ranking as the second most productive journal in this field. Both journals are classified in the Q1 quartile. Additionally, *Frontiers in Psychology* contributed 16 articles, while the *Journal of Sport & Exercise Psychology* published 14 articles (Table 2).

Table 3. Statistics on the 10 most influential journals in the field of research

Journal	NP	TC	h-index	g-index	m-index	PY_start
Mindfulness	24	534	12	23	1.090909091	2015
Frontiers in Psychology	16	191	8	13	0.888888889	2017
International Journal of Environmental Research and Public Health	6	238	6	6	0.545454545	2015
Journal of Clinical Sport Psychology	6	277	4	6	0.222222222	2008
Psychology of Sport and Exercise	4	176	4	4	0.333333333	2014
Current Psychology	4	26	3	4	0.75	2022
Evidence-Based Complementary and Alternative Medicine	3	68	3	3	0.230769231	2013

Journal	NP	TC	h-index	g-index	m-index	PY_start
Healthcare	3	20	3	3	1	2023
International Journal of Sport and Exercise Psychology	7	156	3	7	0.333333333	2017
Journal of Health Psychology	3	109	3	3	0.25	2014

NP = Total Number of Publications, TC = Total Citations, PY-start = Publication Starting Year

Table 3 lists the top 10 journals in mindfulness research within sport and exercise psychology, based on article count and h-index. The h-index is a bibliometric measure used to assess researchers' scientific productivity and the impact of their work (Hirsch, 2005). This indicator takes into account not only the number of publications but also the volume of citations they receive. Among the top 100 most-cited studies, *Mindfulness* leads with 24 publications and 534 citations.

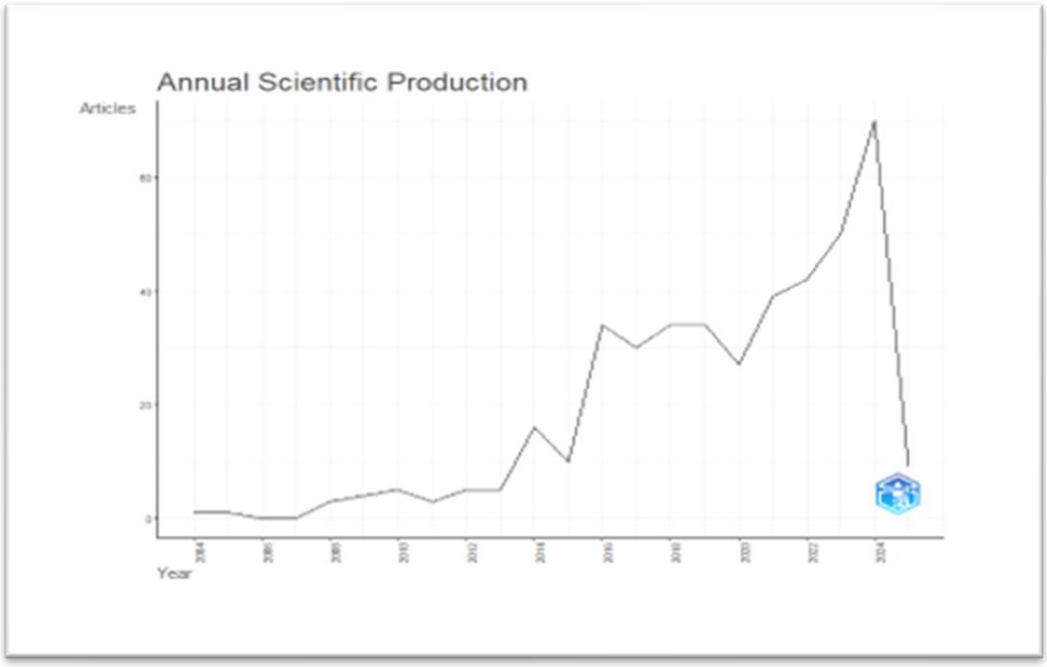

Figure 8. Publication production rates by year

The annual distribution of mindfulness publications in sport and exercise psychology shows that research began in 2004 with a single publication and remained low until 2007. Publications increased to 50 in 2023 and 70 in 2024. Between 2004–2014, 43 documents were published, compared to 379 between 2015–2025, indicating a marked acceleration in academic interest (Figure 8).

Conceptual networks

Figure 9 presents the co-occurrence network of author keywords in mindfulness research within sport and exercise psychology, organized into seven clusters. Each ellipse represents a keyword, with connecting lines indicating relationships and their strength.



Figure 9. Co-occurrence network of frequently used keywords in publications

The "Mindfulness" node shows the highest betweenness (92.34) and PageRank (0.291) values, indicating its central role within the network. It is closely associated with key terms such as "exercise", "physical activity", "mental health", "depression", "stress", and "psychological well-being." Seven clusters were identified: red (Mindfulness), blue (Depression), green (Aerobic exercise), purple (Physical activity), orange (Cognition,), pink (Nutrition), and brown (Health promotion). It can be argued that the concept of mindfulness constitutes a multidimensional line of inquiry within sport and exercise psychology. It is strongly associated with subthemes such as mental health, physical activity, performance, and motivation.

Co-citation analyses

To map the intellectual structure of scientific research on mindfulness in sport and exercise psychology, co-citation relationships among relevant publications were analyzed using a Paper Co-citation Network approach.

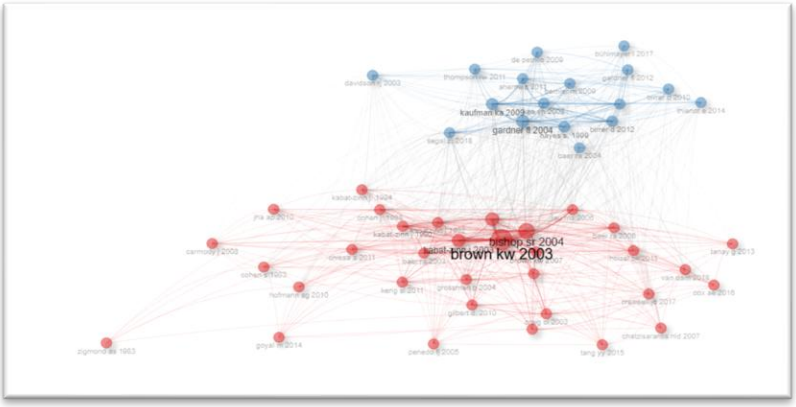

Figure 10. Paper co-citation network

Figure 10 visualizes the co-citation network of publications on mindfulness in sport and exercise psychology, revealing two main clusters: a red cluster (33 publications) and a blue

©IJOESS

cluster (17 publications). Defined by co-citation density and centrality, the red cluster represents the theoretical and methodological foundations of the field, with key authors such as Brown, K.W. (Betweenness: 146.16) and Bishop, S.R. (Betweenness: 113.04). The blue cluster centers on Gardner, F.L. (2004) and Kaufman, K.A. (2009). The network map reveals strong connections between the red and blue clusters. In the red cluster, Brown, K.W. (2003) and Bishop, S.R. (2004) form the most prominent co-citation pair, while Brown, K.W. (2003) is also frequently co-cited with Gardner, F.L. (2004) and Kaufman, K.A. (2009) from the blue cluster. Bishop, S.R. (2004) shows the strongest associations within his cluster, particularly with Brown, K.W. (2003) and various works by Kabat-Zinn, J., and also shares co-citations with Gardner, F.L. (2004) and Hayes, S. (1999) in the blue cluster. Within the blue cluster, Gardner, F.L. (2004) demonstrates strong co-citation relationships with Kaufman, K.A. (2009) and Birrer, D. (2012), while Segal, Z. (2002), Hayes, S. (1999), and Baer, R.A. (2004) exhibit similarly strong intra-cluster connections.

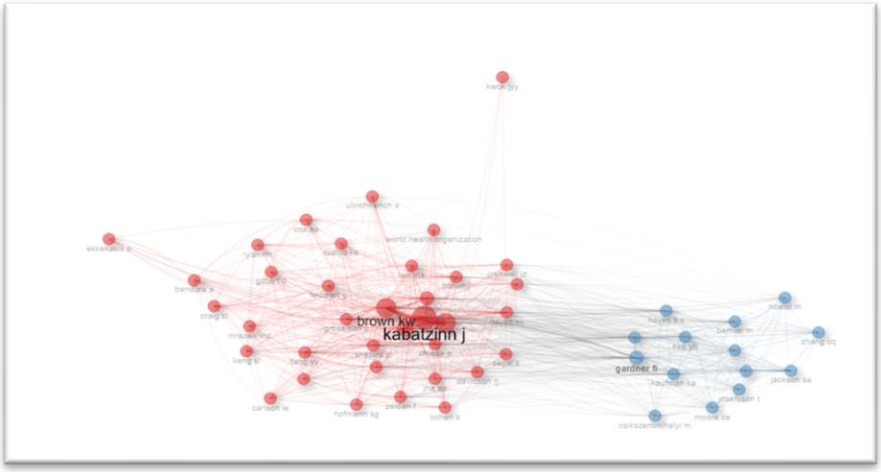

Figure 11. Author co-citation network

An Author Co-Citation Network was constructed to examine citation relationships among authors (Figure 11). The red cluster, centered on Kabat-Zinn, J. (36 authors), and the blue cluster, centered on Gardner, F.L. (14 authors), represent the two main groups. In the red cluster, the authors with the highest betweenness centrality are Kabat-Zinn, J. (144.41), followed by Brown, K.W. (52.46) and Baer, R.A. (39.97). This result indicates that these authors are the most highly connected nodes within the network structure. The highest PageRank value in the same cluster was also calculated for Kabat-Zinn, J. (0.079). This finding shows that Kabat-Zinn, J. has dense co-citation links with other key authors in the cluster, such as Brown, K.W., Baer, R.A., Bishop, S.R., and Chiesa, A. In the blue cluster, Gardner, F.L. has the highest co-citation weight (214.82). Another author with a high co-citation weight is Birrer, D. (126.84).

©IJOESS

Both Gardner, F.L. (0.01136364) and Birrer, D. (0.01136364) also demonstrate the highest centrality values in the network. Across the overall network structure, Kabat-Zinn, J. and Brown, K.W. from the first cluster show reciprocal citation relationships with Gardner, F.L. and Kaufman, K.A. in the second cluster. This indicates a strong flow of knowledge and citations between the two clusters.

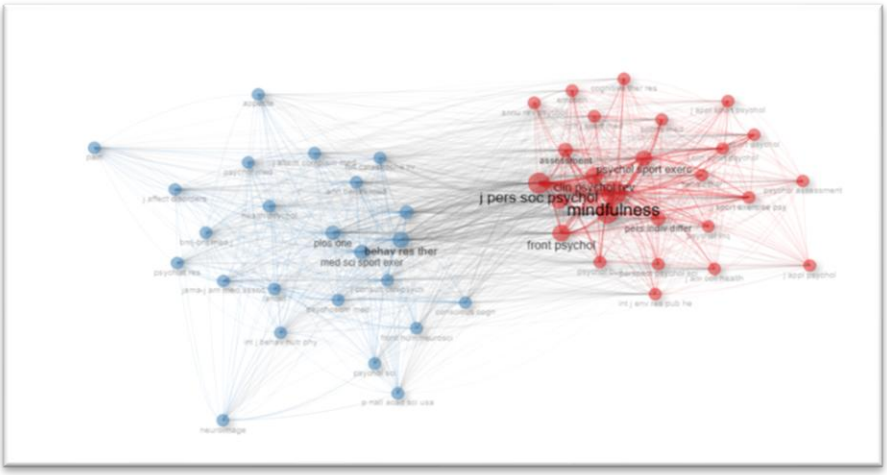

Figure 12. Journal co-citation network

A Journal Co-Citation Network was constructed to examine citation relationships among the top 50 journals with at least two co-citations (Figure 12). The network consists of two clusters: a red cluster (26 journals) and a blue cluster (24 journals). Journals in the red cluster exhibit relatively high closeness centrality values within the network. Examining the co-citation map of this cluster reveals that *Mindfulness*, *Journal of Personality and Social Psychology*, and *Frontiers in Psychology* have strong co-citation links among themselves and with sport psychology-specific journals such as *Journal of Sport and Exercise Psychology* and *Psychology of Sport and Exercise*.

Journals in the blue cluster, including *Behaviour Research and Therapy* and *PLOS ONE*, have slightly higher closeness centrality values compared to the red cluster. Analysis of the blue cluster shows that journals such as *PLOS ONE*, *Behaviour Research and Therapy*, and *Journal of Consulting and Clinical Psychology* maintain strong co-citation relationships with neuroscience journals like *NeuroImage* and general medicine/psychiatry journals such as *JAMA: The Journal of the American Medical Association* and *Psychiatry Research*.

There are numerous co-citation links between the central journals of the red cluster (*Journal of Personality and Social Psychology* and *Clinical Psychology Review*) and the central journals of the blue cluster (*Behaviour Research and Therapy* and *PLOS ONE*). In particular,

©IJOESS

there are strong connections between *Behaviour Research and Therapy* in the blue cluster and *Journal of Personality and Social Psychology* in the red cluster.

Social networks

Figure 13 presents the author collaboration network in mindfulness research in sport and exercise psychology, including 41 authors with at least two co-authored publications, organized into 13 clusters. Nodes represent authors, and connections indicate co-authorship, with colors reflecting cluster membership. The blue cluster, led by Bögels, S.M., de Bruin, E.I., van der Zwan, J.E., de Vente, W., and Huizink, A.C., shows extensive collaboration, with Bögels occupying a central position.

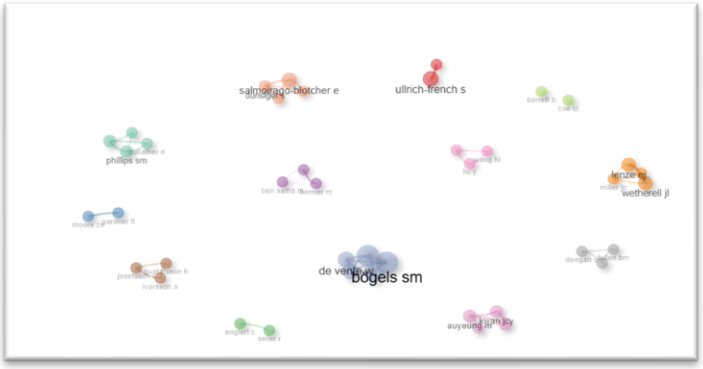

Figure 13. Author collaboration

As shown in Figure 13, Bögels S.M. occupies a central position in the network structure, while the other clusters display more bilateral or small-group collaboration patterns. This suggests that publications in the field are primarily produced within specific research groups, with large-scale international collaborations being limited.

The results of the inter-institutional collaboration analysis conducted to examine the collaboration patterns of institutions focusing on mindfulness in the field of sport and exercise psychology are presented in Figure 14.

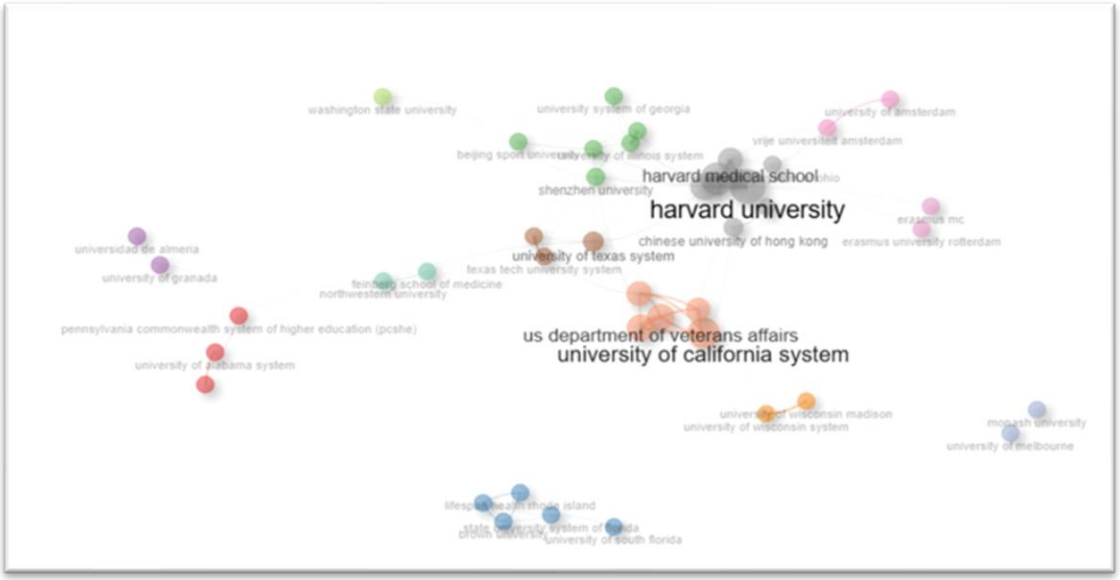

Figure 14. Institutional collaboration

Institutions are grouped into 13 clusters, with the gray cluster centered on Harvard University containing the most institutions (7 institutions). In the inter-institutional collaboration network (Figure 14), the University of Texas System serves as a key bridge with the highest betweenness centrality (233.76), followed by Harvard University (114.12) and the University of California System (67.68). Other significant connectors include Harvard Medical Affiliates, Massachusetts General Hospital, and the Chinese University of Hong Kong. Harvard University, Harvard Medical Affiliates, and University of California, San Diego hold the highest PageRank values. The University of California System and U.S. Department of Veterans Affairs occupy central positions, while regional clusters include the University of Amsterdam, Vrije Universiteit Amsterdam, Erasmus University Rotterdam, and Erasmus MC, as well as the University of Melbourne and Monash University.

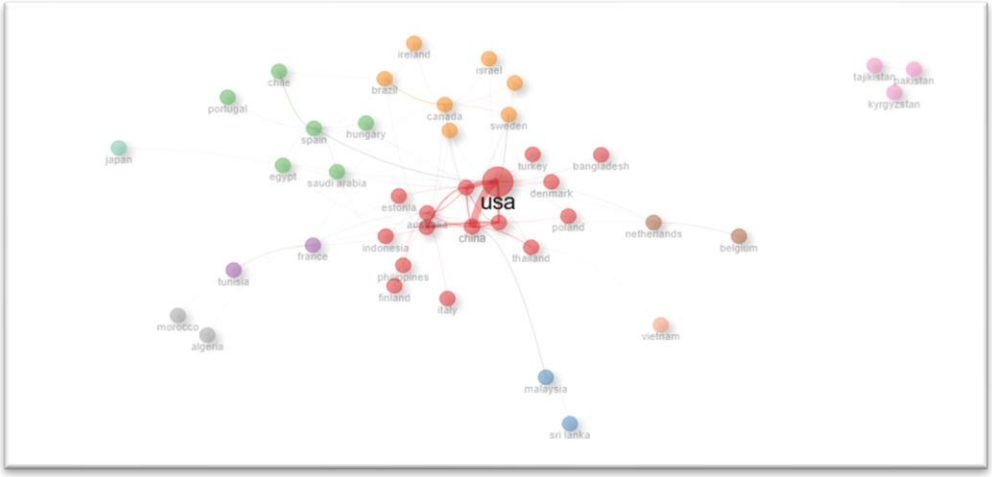

Figure 15. International collaboration

©IJOESS

Figure 15 shows the country-level collaboration network, with 10 clusters. Each circle represents a country. The cluster containing the most countries is the red cluster, which includes 16 countries. According to the analysis, the United States occupies the center of the network and exhibits the highest interaction values (Betweenness = 156.73; PageRank = 0.1056). It is followed by the United Kingdom (Betweenness = 201.49; PageRank = 0.0952), China (Betweenness = 100.99; PageRank = 0.0763), Australia (Betweenness = 96.86; PageRank = 0.0600), and France (Betweenness = 107.44; PageRank = 0.0328).

The red cluster includes the United States, China, Germany, Australia, the United Kingdom, Switzerland, Turkey, Indonesia, Italy, Poland, Thailand, Denmark, the Philippines, Bangladesh, Estonia, and Finland. The blue cluster contains Malaysia and Sri Lanka, while the green cluster includes Spain, Hungary, Chile, Egypt, Portugal, and Saudi Arabia. The purple cluster consists of France and Tunisia, whereas the orange cluster includes Canada, Sweden, Brazil, Iran, Ireland, Israel, and Norway. The brown cluster consists of only the Netherlands and Belgium, with these countries maintaining reciprocal collaborations but exhibiting limited interactions with other clusters. The pink cluster consists of Kyrgyzstan, Pakistan, and Tajikistan. These countries form a small subnetwork, connected only among themselves, without links to other countries. This cluster structure indicates that these countries have not developed extensive collaborative ties within the international partnership network. The gray cluster contains Algeria and Morocco, the dark green cluster consists of Japan, and the light pink cluster includes Vietnam.

The network shows that the United States occupies a central position and maintains strong connections with numerous countries. Additionally, China, the United Kingdom, Australia, Switzerland, and France are among the countries with high connectivity.

Authors

Authors in the examined research area were analyzed in two dimensions to determine both the most relevant and the most local cited. In this context, the total publication output of authors reflected their level of contribution to the research, whereas the number of citations they received indicated their academic impact and visibility. This two-dimensional analysis enabled a more comprehensive identification of leading researchers and a clearer understanding of the distribution of knowledge production within the field.

©IJOESS

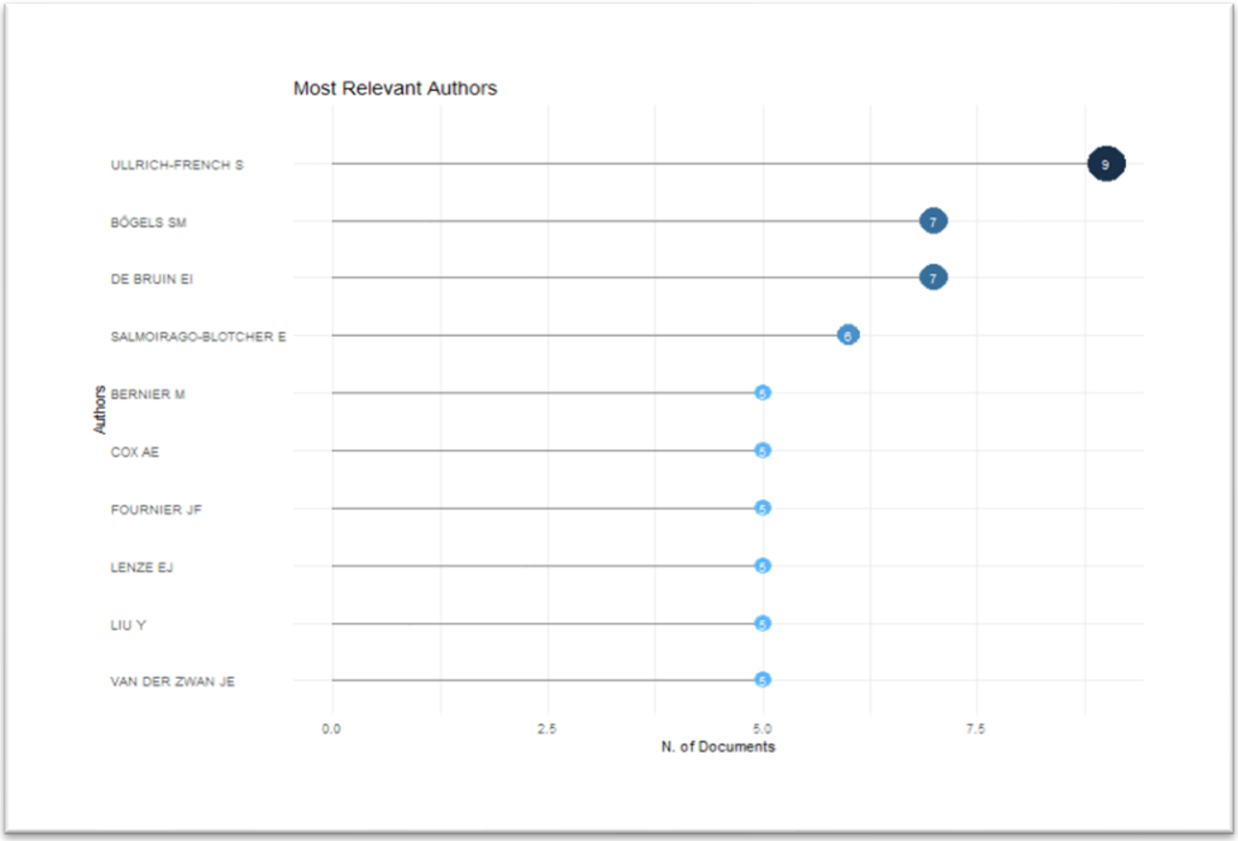

Figure 16. The most productive author

Figure 16 shows that the most productive author in terms of publication count is Ullrich-French, S., followed by Bögels, S.M., and De Bruin, E.I. A high publication count reflects a researcher's sustained scientific productivity within the field, the breadth of their contribution to shaping the literature, and their visibility within the research community. Therefore, author analysis based on publication volume is considered an important indicator for understanding the intellectual dynamics of the field and the positioning of its leading scholars.

©IJOESS

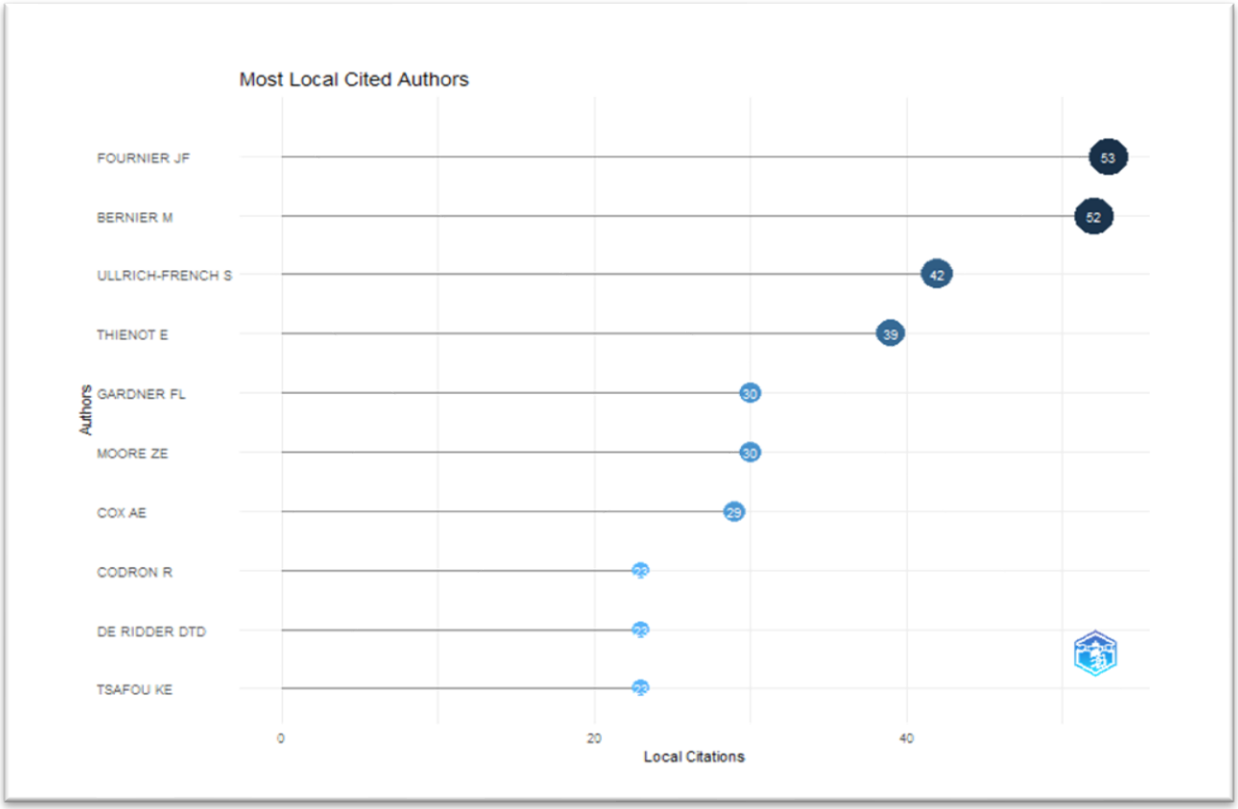

Figure 17. The author with the highest number of citations

Figure 17 indicates that the author with the highest number of citations is Fournier, J.F., followed by Bernier, M., and Ullrich-French, S. It can be stated that a researcher with a high citation count has produced work that exerts a significant impact on the literature, is frequently referenced by other authors, and contributes substantially to the shaping of scientific discourse. Accordingly, citation-based author analysis serves as an important tool for identifying the researchers who exert the greatest influence on knowledge production and for understanding how the intellectual structure of the field is shaped.

DISCUSSION AND CONCLUSION

This study examined the scholarly position of mindfulness research in sport, exercise, and physical activity by analyzing 422 documents indexed in the Web of Science Core Collection (WoSCC) using bibliometric methods.

The bibliometric analyses revealed a marked increase in scholarly interest in the field, particularly after 2015. An examination of publication frequencies shows that *Mindfulness*, *Annals of Behavioral Medicine*, and *Frontiers in Psychology* are the most productive journals in the field, collectively accounting for 19.66% of the 290 articles. In the author analysis, Ullrich-French S. emerged as the most productive researcher in terms of publication count,

while Fournier J.F. stood out as the most influential author based on citation impact. These findings indicate that scholarly productivity and influence in the field are concentrated around specific authors and journals. The prominence of the United States in single-country publications and China's leading role in multiple-country collaborations suggest that both countries play a significant role in shaping the development of the field. The analysis further demonstrates that research collaborations in mindfulness and exercise are predominantly driven by institutions in the United States. Similarly, the United States was identified as the most cited country, receiving a total of 2.170 citations. The central positions of the University of Texas System and Harvard University within the collaboration network highlight these institutions as key hubs for knowledge production and international scientific cooperation.

Overall, research on mindfulness in sport, exercise, and physical activity has grown rapidly over the past decade, expanding from psychology into health and sport sciences. Bradford's Law analysis indicates that publications cluster in core journals, reflecting the field's consolidation. Globally, the United States, United Kingdom, China, Australia, and France form the main research network. This indicates that mindfulness-based research has a strong academic collaboration network at the international level. The term "mindfulness" occupies a central position in the sport and exercise psychology literature, demonstrating strong connections with physical activity, mental health, stress, depression, and well-being, which highlights the interdisciplinary nature of the field. This underscores the role of mindfulness-based approaches as a central axis in research addressing both psychological and physical health. The field intersects with psychology, sport science, and health sciences, suggesting potential for increased interdisciplinary studies in the future. The prominence of the journal *Mindfulness* indicates the concentration of publications in select journals, which may guide researchers in publication strategies. The growing number of publications over time reflects the increasing popularity of mindfulness as a research topic. Most existing publications focus on meditation and mental health; however, future research could explore less studied areas such as motor skill development, team dynamics, leadership, or post-injury rehabilitation.

In conclusion, this study provides a comprehensive bibliometric overview of mindfulness research in sport, exercise, and physical activity, highlighting trends in productivity, collaboration networks, and thematic directions. Findings indicate rapid growth in recent years, with particular emphasis on psychological well-being, stress reduction, and mental health. Mindfulness emerges as a holistic approach that supports both individual performance and psychological resilience within the context of sport sciences. Future research may uncover the

©IJOESS

psychophysiological mechanisms underlying mindfulness through interdisciplinary collaboration across the fields of sport science, psychology, and neuroscience.

Recommendations

- The study bibliometrically identifies mindfulness's role in sport and exercise psychology.
- *Mindfulness* and *Annals of Behavioral Medicine* are the most productive journals.
- Mindfulness is closely linked to psychological well-being and physical activity.
- The analysis revealed key publications and leading researchers in the field.

Limitations and strengths

The analysis was restricted to the Web of Science Core Collection (WoSCC), excluding other databases such as PubMed, Scopus, EMBASE, PsycINFO, and the Cochrane Library, which limits the comprehensiveness of the literature included. The study was conducted using specific keywords in the WoS database, which resulted in the identification of studies published between 2004 and 2025. Within this scope, the limitations associated with the selected keywords may have led to the exclusion of some studies from earlier years. Although keywords ("mindfulness" AND "sport" OR "exercise" OR "physical activity") were carefully selected, some relevant studies using alternative terms may have been excluded. Only specific document types (articles, book chapters, early access, book review, correction, editorial material, letter, meeting abstract, proceeding paper, review, review; early access) were analyzed, while theses, reports, and grey literature were not included. Biblioshiny, the analytic tool used, relies solely on metadata and does not assess the scientific quality, methodological rigor, or theoretical contribution, of publications. Finally, the study was limited to English-language publications.

This study offers several notable strengths that contribute meaningfully to its overall value and scholarly impact. First, by analyzing 422 documents indexed in the Web of Science Core Collection, the study provides one of the most comprehensive bibliometric overviews to date on mindfulness research within the domains of sport, exercise, and physical activity. The breadth of this dataset allows for the identification of long-term publication trends and the mapping of the field's developmental trajectory with considerable accuracy. Second, the study adopts a multidimensional bibliometric approach, integrating publication and citation analyses, co-authorship and international collaboration networks, co-citation structures, Bradford's Law, and thematic mapping techniques. This diverse methodological framework offers a holistic portrayal of the research landscape and helps identify the field's intellectual foundations, social structures, and evolving thematic priorities. Another strength lies in its detailed examination of

the global research network. The visualization of these networks highlights the increasingly global and interconnected nature of mindfulness research within sport and exercise sciences. Additionally, the identification of core journals, influential authors, and leading institutions contributes to a clearer understanding of where scholarly productivity and impact are concentrated. Such insight can inform strategic decisions by researchers regarding target journals, potential collaborators, and emerging areas of influence within the field. The study also makes a meaningful conceptual contribution by mapping thematic clusters and demonstrating the central role of mindfulness within broader discussions of physical activity, mental health, stress, depression, and well-being. These findings highlight the interdisciplinary character of the field and underscore its potential for continued integration across psychology, sport sciences, and health sciences. This study makes existing gaps in the literature visible and provides a clear direction for researchers.

REFERENCES

Anderson, S. A., Haraldsdottir, K., & Watson, D. (2021). Mindfulness in athletes. *Current Sports Medicine Reports, 20*(12), 655–660. [Crossref]

Aria, M., & Cuccurullo, S. (2017). Bibliometrix: An r-tool for comprehensive science mapping analysis. *Journal of Informetrics*, *11*(4), 959–971. [Crossref]

Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice, 10*(2), 125–143. [Crossref]

Baminiwatta, A., & Solangaarachchi, I. (2021). Trends and developments in mindfulness research over 55 years: A bibliometric analysis of publications indexed in Web of Science. *Mindfulness,* 12(9), 2099–2116. [Crossref]

Birrer, D., Scalvedi, B., & Frings, N. (2023). A bibliometric analysis of mindfulness and acceptance research in sports from 1969 to 2021. *Mindfulness, 14*(5), 1038–1053. [Crossref]

Bunjak, A., Černe, M., & Schölly, E. L. (2022). Exploring the past, present, and future of the mindfulness field: A multitechnique bibliometric review. *Frontiers in Psychology, 13*, 792599. [Crossref]

Bühlmayer, L., Birrer, D., Röthlin, P., Faude, O., & Donath, L. (2017). Effects of mindfulness practice on performance-relevant parameters and performance outcomes in sports: A meta-analytical review. *Sports Medicine*, *47*, 2309-2321. [Crossref]

Chiesa, A., & Serretti, A. (2009). Mindfulness-based stress reduction for stress management in healthy people: A review and meta-analysis. *Journal of Alternative and Complementary Medicine, 15*(5), 593–600. [Crossref]

Coimbra, D. R., Ferreira, L., da Costa, J., & Calmeiro, L. (2022). Scientific production in the field of sport and exercise psychology: A bibliometric analysis of the 2001–2020 period. *Revista de Psicología del Deporte/ Journal of Sport Psychology, 31*(1), 1–13. https://www.scielo.br/j/rbme/a/XdLgbg5j6zc6ZYfwdf4mqzK/?format=html&lang=en

Crane, R. S., Brewer, J., Feldman, C., Kabat-Zinn, J., Santorelli, S., Williams, J. M., … et al. (2017). What defines mindfulness-based programs? The warp and the weft. *Psychological Medicine, 47*(6), 990–999. [Crossref]

Creswell, J. D. (2017). Mindfulness interventions. *Annual Review of Psychology, 68*, 491–516. [Crossref]

Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research, 133*, 285–296. [Crossref]

Ferreira, G. F., & Demarzo, M. (2024). Trends of research on mindfulness: A bibliometric study of an emerging field. *Trends in Psychology, 32*(2), 466–479. [Crossref]

Grant, M. J., & Booth, A. (2009). A typology of reviews: An analysis of 14 review types and associated methodologies. *Health Information & Libraries Journal*, *26*(2), 91-108. [Crossref]

Hirsch, J. E. (2005). An index to quantify an individual's scientific research output. *Proceedings of the National Academy of Sciences of the USA, 102*(46), 1656916572. [Crossref]

Kabat-Zinn, J. (1982). An outpatient program in behavioral medicine for chronic pain patients based on the practice of mindfulness meditation: Theoretical considerations and preliminary results. *General Hospital Psychiatry 4*(1), 33–47. [Crossref]

Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: past, present, and future. *Clinical Psychology: Science and Practice, 10*(2), 144–156. [Crossref]

Lindahl, J., Stenling, A., Lindwall, M., & Colliander, C. (2015). Trends and knowledge base in sport and exercise psychology research: A bibliometric review study. *International Review of Sport and Exercise Psychology*, *8*(1), 71-94. [Crossref]

Liu F., Zhang Z., Liu S., & Zhang, N. (2021). Examining the effects of brief mindfulness training on athletes' flow: The mediating role of resilience. *Evidence-Based Complementary and Alternative Medicine*, *2021*, 6633658. [Crossref]

Liu, W. (2019). The data source of this study is web of science core collection? Not enough. *Scientometrics, 121*(3), 1815–1824. [Crossref]

Ludwig, D. S., & Kabat-Zinn, J. (2008). Mindfulness in medicine. *JAMA, 300*(11), 1350–1352. [Crossref]

Noetel, M., Ciarrochi, J., Van Zanden, B., & Lonsdale, C. (2019). Mindfulness and acceptance approaches to sporting performance enhancement: A systematic review. *International Review of Sport and Exercise Psychology, 12*(1), 139–175. [Crossref]

Reavie, K. T. (2009). Mining the research literature in system biology. In S. Krawetz (Ed.), *Bioinformatics for Systems Biology* (369-384). Springer. [Crossref]

Rogowska, A. M., & Tataruch, R. (2024). The relationship between mindfulness and athletes' mental skills may be explained by emotion regulation and self-regulation. *BMC Sports Science, Medicine and Rehabilitation, 16*(68). [Crossref]

Sabé, M., Chen, C., Vancampfort, D., Firth, J., Stubbs, B. & Schuch, F. B. (2025). Half a century of research for mind–body interventions: A scientometric analysis. *Mindfulness, 16*(7), 1765–1779. [Crossref]

Schneider, J., Malinowski, P., Watson, P. M., & Lattimore, P. (2019). The role of mindfulness in physical activity: A systematic review. *Obesity Reviews*, *20*(3), 448-463. [Crossref]

Shonin E., Van Gordon, W., & Griffiths, M. (2013). Mindfulness-based interventions: Towards mindful clinical integration. *Frontiers in Psychology, 4*(194). [Crossref]

Si, X. W., Yang, Z. K., & Feng, X. (2024). A meta-analysis of the intervention effect of mindfulness training on athletes' performance. *Frontiers in Psychology*, *15*, 1375608. [Crossref]

Wang, W., Wang, Q., Liu, Q., Li, W., & Wei, R. (2021). Global scientific trends on mindfulness: A bibliometric analysis from 1980 to 2020. *Frontiers in Psychology, 12*, 690967. [Crossref]

Wang, Y., Lei, S. M., & Fan, J. (2023). Effects of mindfulness-based interventions on promoting athletic performance and related factors among athletes: A systematic review and meta-analysis of randomized controlled trial. *International Journal of Environmental Research and Public Health, 20*(3), 2038. [Crossref]

Xie, B., Lei, S., Choi, N., Choi, S. M., Wang, X., & Chen, Y. (2025). Impact of mindfulness-based interventions on sports performance and mental health: An umbrella review. *Journal of Exercise Science and Fitness, 23*(4), 261–272. [Crossref]

Zhang, Y., Zhou, M., Yin, Z., Zhuang, W., & Wang, Y. (2024). Relationship between physical activities and mental health in older people: A bibliometric analysis. *Frontiers in Psychiatry, 15*, 1424745. [Crossref]

KATKI ORANI ***CONTRIBUTION RATE***	**AÇIKLAMA** ***EXPLANATION***	**KATKIDA BULUNANLAR** ***CONTRIBUTORS***
Fikir ve Kavramsal Örgü *Idea or Notion*	Araştırma hipotezini veya fikrini oluşturmak *Form the research hypothesis or idea*	Zeynep Ayça TERZİOĞLU, Nazmi BAYKÖSE
Tasarım *Design*	Yöntem ve araştırma desenini tasarlamak *To design the method and research design.*	Zeynep Ayça TERZİOĞLU, Nazmi BAYKÖSE
Literatür Tarama *Literature Review*	Çalışma için gerekli literatürü taramak *Review the literature required for the study*	Zeynep Ayça TERZİOĞLU
Veri Toplama ve İşleme *Data Collecting and Processing*	Verileri toplamak, düzenlemek ve raporlaştırmak *Collecting, organizing and reporting data*	Zeynep Ayça TERZİOĞLU, Nazmi BAYKÖSE
Tartışma ve Yorum *Discussion and Commentary*	Elde edilen bulguların değerlendirilmesi *Evaluation of the obtained finding*	Zeynep Ayça TERZİOĞLU

Destek ve Teşekkür Beyanı/ *Statement of Support and Acknowledgment*

Bu çalışmanın yazım sürecinde katkı ve/veya destek alınmamıştır.

No contribution and/or support was received during the writing process of this study.

Çatışma Beyanı/ *Statement of Conflict*

Araştırmacıların araştırma ile ilgili diğer kişi ve kurumlarla herhangi bir kişisel ve finansal çıkar çatışması yoktur.

Researchers do not have any personal or financial conflicts of interest with other people and institutions related to the research.

Etik Kurul Beyanı/ *Statement of Ethics Committee*

Bu araştırma, bibliyometrik bir çalışma olduğu için etik izin başvurusunda bulunulmamıştır.

As this research is a bibliometric study, no ethical approval was required.

This study is licensed under a **Creative Commons Attribution-NonCommercial 4.0 International License (CC BY 4.0).**