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Bibliometric analysis of research on spirituality and sport (1996–2023)

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ABSTRACT

This study conducted a bibliometric analysis of scientific publications on spirituality and sport indexed in the Web of Science (WoS) Core Collection between 1996 and 2023. A total of 226 publications were analyzed to identify research trends, influential journals and authors, country productivity, citation patterns, keyword co-occurrence, and thematic structures. The findings revealed an annual publication growth rate of 11.3%, indicating increasing academic interest despite fluctuations in yearly output. Pedagogics Psychology Medical-Biological Problems of Physical Training and Sports was the most productive journal, while Journal of Personality and Social Psychology was the most frequently cited source. Tavel, P. was the most productive author, whereas Jirasek, I. was the most locally cited author. Japan, the United States, and Ukraine demonstrated the highest scientific productivity. The most frequent keywords were spirituality, health, and mental health, while the co-occurrence analysis revealed strong connections among spirituality, religion, and sport. The thematic analysis identified underexplored areas, including spirituality and quality of life, spirituality among older adults, and spirituality in sports team dynamics. Overall, these findings highlight the growing intersection of spirituality and sport and the need for further interdisciplinary research addressing mental health, well-being, resilience, and athletes' holistic development.

KEYWORDS

Spirituality; Sports; Bibliometric Analysis; Mental Health; Religion

1. INTRODUCTION

Although sport is often perceived as an activity associated with physical competence and competitive success, it has a much deeper and multifaceted place in human life. Research in the field of cultural sport psychology shows that sport can have a strong connection with individuals' beliefs,

values and spiritual experiences. Sport, especially for individuals involved in team sports, can become not only a domain of physical skills, but also an area of deep spiritual connection and the shaping of individual values and beliefs (Schinke et al., 2009). While spirituality and religion occupy an essential place in the lives of individuals, it has been observed that athletes have increasingly emphasized their spiritual practices in recent years (Fisher et al., 2003; Czech & Bullet, 2007).

Religion and spirituality have historically existed in all societies, helping individuals to maintain their physical, mental and spiritual integrity. Research has demonstrated the positive effects of spiritual and religious beliefs on people's health and has shown that spiritual practice plays an essential role in improving mental health and coping with emotional difficulties such as depression and anxiety (Idler, 2008; Koenig, 2012). These findings are important for understanding how athletes use spiritual and religious beliefs as a coping mechanism in the face of career challenges and pressures. Many athletes develop psychological resilience through prayer, meditation, and other spiritual rituals in line with their beliefs. They emphasize that these spiritual practices play an essential role in enhancing their performance (Vernacchia et al., 2000; Czech et al., 2004).

However, studies examining the relationship between spirituality, religion and sports performance are still limited in the literature on sport psychology. Previous research on the psychological effects of religion and spirituality on athletes suggests that these two domains should be examined in more depth in the context of sport psychology (Koenig, 2009). It has been found that athletes' spiritual beliefs function as a supportive element throughout their sports careers and that these beliefs help them cope with difficulties and give meaning to their careers (Vernacchia et al., 2000). Nonetheless, sports sociologists who acknowledge the significance of religion and spirituality in athletes' lives have undertaken some research (Stevenson, 1991; Hoffman, 1992; Nixon & Frey, 1996; Coakley, 2003). However, there aren't many research in sports psychology that look at the connection between spirituality/religion and athletic performance.

Numerous studies have shown how religion and spirituality can improve athletic performance and how prayer has a major positive psychological impact on managing stress and anxiety (Hoffman, 1992; Balague, 1999; Dillon & Tait, 2000; Vernacchia et al., 2000; Park, 2000; Emmons, 2003; Watson & Czech, 2005; Czech & Bullet, 2007; Maranise, 2013). For a variety of causes (e.g., a missed season, illness, career-ending injuries, training, playing time or poor identity development), athletes frequently battle with unforeseen stressful events and anxiety. Athletes who practice religion or spirituality are better able to handle emotional stress and anxiety, accept criticism in a positive way, and give their professional triumphs and setbacks a greater significance (Vernacchia et al.,

2000; Watson & Nesti, 2005). In their study of 15 Olympic track and field athletes, Vernacchia et al. (2000) looked at psychosocial elements that were significant to their growth both personally and athletically. Dreams, development, performance hurdles, mental attributes/preparation, and advice for young athletes were among the general themes and interview questions. In four of the five topics, religious or spiritual elements (such as prayer) were mentioned. As a result, religion and spirituality are viewed as crucial components that support them during the highs and lows of their athletic careers. Additionally, religious/spiritual athletes use their faith to find solace in difficult and trying times, inner strength, hope, and release from the anxiety that comes with competing at a high level (Higdon, 1992; Hoffman, 1992; Gould et al., 1997; Clements & Koenig, 2014).

According to certain studies, athletes frequently pray before, during, and after competitions, which improves their general wellbeing and performance (Dale, 1996; Park, 2000; Vernacchia et al., 2000; Kreider, 2003; Czech et al., 2004; Watson & Czech, 2005; Czech & Bullet, 2007; Hopsicker, 2009). Athletes are more likely than ever to reveal their spiritual or religious beliefs. Athletes employ ritualistic practices (like prayer) as a belief system to manage inevitable stressful situations, cope with personal issues that impact their sports lives, improve performance, foster team togetherness, and encourage a morally upright lifestyle (Acevedo et al., 1992; Park, 2000; Coakley, 2003; Czech et al., 2004; Watson & Czech, 2005; Czech & Bullet, 2007; Maranise, 2013).

Spirituality is not limited to religious or spiritual experiences but is also linked to important relationships and memories in an athlete's life. An athlete's close relationships can add an overall spiritual dimension, increasing their emotional and social support. In addition, extraordinary moments, such as winning an Olympic medal or achieving a personal best, can take on a spiritual meaning, increasing an athlete's self-confidence and inner satisfaction. Such achievements offer not only a physical gain for athletes, but also a profound spiritual experience (Watson & Nesti, 2005).

An athlete's statement that follows encapsulates a lot of these ideas: “You will succeed in the future, even though it might not happen now. Even if it isn't the next day or a year from now, if you have patience, keep your goals in sight, and have faith that God will grant you what you desire, it will eventually arrive. It's not the victory that makes you a better person; it's the path you take to get there, and it's the sacrifices, the training, the struggle, and the work that you do, not just winning and standing on the top step of the podium, that will make you a better person” (Vernacchia et al., 2000).

This study used the bibliometric analysis method. Bibliometrics is recognized as an effective method for studying and understanding research trends in a particular field. This method aims to

analyze various components of academic publications through numerical data and statistics. Bibliometric analysis is a method that quantitatively examines scientific publications and provides statistical interpretations of research, authors, countries, citations, and other publication indicators. This analysis helps in understanding the structure of scientific knowledge production by revealing collaborations and interactions among researchers and research groups (Broadus, 1987; Osareh, 1996; Heberger et al., 2010; Donthu et al., 2021). Bibliometrics offers powerful tools to describe, explain, and evaluate the structure and functioning of scholarly communication and to predict future trends. Thanks to these features, it is especially used in scientific fields based on numerical data (Borgman & Furner, 2002). As a result, bibliometric analysis is an important tool for the management and strategic planning of scientific research (Cobo et al., 2011). In recent years, rapid developments in information technologies and the conveniences offered by these technologies have increased interest in bibliometrics and popularized this method. In this way, the dynamics of scientific literature can be analyzed more systematically.

Performance analysis and scientific mapping are the two primary categories into which bibliometric analysis methodologies are typically separated (Cobo et al., 2011). In these analyses, one or both techniques can be used for a specific purpose. Performance analysis assesses the scientific contributions of research entities (authors, institutions, journals, etc.) and provides an overview of the research field based on the scientific outputs. Scientific mapping, on the other hand, examines the relationships between researchers, key concepts, publications, and citations, revealing the networks of connections between these components (Gutiérrez-Salcedo et al., 2018). In this way, structural and dynamic relationships in scientific fields can be better understood.

The literature contains several bibliometric research in various domains (Ardito et al., 2019; Türkistanlı et al., 2021; Bakır et al., 2022). When bibliometric analyses related to the field of sport have been examined, it becomes evident that various studies have been conducted using the Web of Science database (Ho & Ho, 2015; Wang & Ho, 2019; Podrihalo et al., 2022; Lara-Aparicio et al., 2022). However, there isn't a single bibliometric study that addresses the ideas of "sport" and "spirituality" together in the literature. Therefore, by addressing this gap, it is anticipated that this work will significantly advance the knowledge.

This lack of integration between the domains of sport and spirituality from a bibliometric perspective indicates a critical gap in the research landscape. While spirituality is increasingly acknowledged as a key factor influencing athletes' psychological well-being, performance motivation, and coping strategies, no large-scale quantitative synthesis has been conducted to map

the evolution, trends, and intellectual structure of research in this area. As a result, researchers and practitioners lack a comprehensive framework that shows who is publishing on the topic, what themes are dominant, and which collaborations or countries are leading the field. Addressing this gap is essential to understanding how the spiritual dimension of sport is reflected in academic discourse.

The purpose of this study is to use the bibliometric analysis approach to thoroughly review the scientific literature on the ideas of "sport" and "spirituality". Athletes who practice religion or spirituality may find that it gives them the inner strength and sense of stability they need to handle the uncertainties of sports. Even though there hasn't been as much research on religion and spirituality in sport psychology as there has been in general psychology or medical science, earlier studies have shown how important it is to athletes' lives. Therefore, this study will provide researchers with a comprehensive review of the existing scientific literature to understand the connection between religion/spirituality and sport. It will also provide insight into how spirituality can be integrated into sport psychology, and emphasize the need to complete the missing aspects of the literature in this field, and evaluate the role of religious/spiritual practices in the lives of athletes more comprehensively.

2. METHODS

2.1. Design

This study examines the bibliometric properties of the publications identified with the keywords "spirituality" and "sports" in the Web of Science database using a systematic literature review approach. A systematic literature review is a method that involves systematically scanning, selecting, and analyzing existing scientific articles on a specific topic according to certain criteria (Snyder, 2019). This method allows researchers to comprehensively review the existing literature and draw conclusions based on reliable evidence (Rother, 2007).

The study data consist of studies published in various journals in the WoS database between 1996 and 2023, and related to the keywords "spirituality" and "sports." Based on the data obtained within the framework of the study, this date was chosen as the starting date since the first study in the database was published in 1996. Since the year had not yet ended at the time of the current study in 2023, studies published in 2024 were not included to avoid affecting the analysis. International citation indexes such as Arts and Humanities Citation Index (A&HCI), Social Science Citation Index (SSCI), Science Citation Index (SCI), and are the most important data sources in bibliometric studies.

In this context, the Web of Science database providing access to these indexes was used for the research (Güzeller & Çeliker, 2017).

The R-Studio program, which is compatible with the Web of Science database, was used to analyze the bibliometric results of the studies that were conducted within the parameters of the study (Kurtuluş & Bilen, 2021; Kurtuluş & Tatar, 2021).

2.2. Data Collection

In this study, 234 studies were obtained by searching the WOS database with the keywords "sports" and "spirituality." 226 studies were found when constraints on document type and time period were implemented in accordance with the study's objectives. The analysis determined the most published journals, the amount of citations, the authors with the most publications, cooperation networks, keywords, and theme structures in addition to the distribution of these 226 studies by years.

2.3. Data Analysis

In this study, the following step was applied to the data file created according to the research criteria from the WoS database: First, the "export" option was clicked. Then, the "full record and cited references" option was selected using the WoS export option, and the bibtex file was created. Afterwards, the "bibliometrix" package was downloaded and activated in R-Studio. After running the "bibliometrix" package in R-Studio, the user was directed to the bibliometric analysis page through a specific URL. Here, the "bibtex" file was uploaded to the data section and analyzed.

In addition to descriptive performance metrics, this study also applied bibliometric mapping techniques, particularly co-citation analysis and co-occurrence analysis, to explore the intellectual and conceptual structures of the research field. Co-citation analysis was used to identify connections between documents that are frequently cited together, providing insight into the underlying intellectual structure and influential 6ajör in the field. Co-occurrence analysis, on the other hand, focused on identifying relationships among frequently used keywords across the 6ajör6e6re, allowing 6ajör6e detection of 6ajör themes and conceptual trends. These analyses were conducted using the "Bibliometrix" package in R-Studio, with functions such as biblioNetwork, networkPlot, and thematicMap employed to generate the corresponding visualizations (Cobo et al., 2011; Donthu et al., 2021).

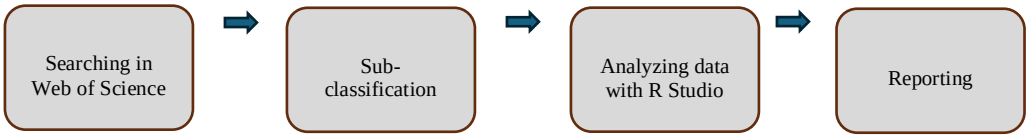


Figure 1. Working Diagram

2.4. Ethical Considerations

In this study, all the rules specified in the "Directive on Scientific Research and Publication Ethics of Higher Education Institutions" were followed. None of the actions specified under the second section of the Directive, "Actions Contrary to Scientific Research and Publication Ethics", were carried out. The data of the study were collected from open access databases accessible through university subscription. These data are available upon request. This study does not involve human participants and therefore institutional ethics committee approval was not required.

3. RESULTS

In the WoS database, 226 studies conducted between 1996 and 2023 were included in the analysis. The general information table containing the data of keywords, authors, single and collaborating authors, study types and numbers, provides a detailed analysis of the research results.

Table 1. General information

Description	Results
Main Information About Data	
Timespan	1996:2023
Sources (Journals, Books, Etc)	131
Documents	226
Annual Growth Rate %	11.3
Document Average Age	9.04
Average Citations Per Doc	7.186
References	8577
Document Contents	
Keywords Plus (ID)	466
Author's Keywords (DE)	800
Authors	
Authors	638
Authors of Single-Authored Docs	81
Authors Collaboration	
Single-Authored Docs	91
Co-Authors Per Doc	3.12
International Co-Authorships %	21.68
Document Types	
Article	220
Article; Book Chapter	4
Article; Early Access	2

According to Table 1, 226 articles published in the WOS database between 1996 and 2023 using the keywords “spirituality” and “sports”. The annual growth rate of the studies is 11.3%. 638 different authors contributed to these published articles and 800 keywords were used by the authors. 8577 references were cited in the articles. The annual citation rate of each article was determined as 7.19%. Table 2 shows the annual publication production rate.

Table 2. Annual scientific production

Year	Articles	Year	Articles
2023	18	2009	9
2022	14	2008	9
2021	21	2007	10
2020	17	2006	10
2019	12	2005	18
2018	13	2004	1
2017	12	2003	0
2016	16	2002	1
2015	13	2001	0
2014	12	2000	0
2013	6	1999	0
2012	3	1998	0
2011	5	1997	0
2010	5	1996	1

When we look at the studies on “spirituality” and “sports” in Table 2, which shows the annual publication production rate, we see that from 1996 to 2023, there was a significant increase in the number of studies on related topics in 2005, followed by a decline until 2014, and a certain level of increase was observed between 2014 and 2023, although there were fluctuations in the number of studies. This noticeable increase in 2005 may be attributed to the growing global awareness of mental health and well-being in both academic and athletic contexts during the early 2000s. Several international movements, including the WHO’s expanded focus on holistic health and the rise of positive psychology as a research domain, likely contributed to increased interest in spirituality-related topics. Additionally, journals focusing on health, psychology, and education began to show a broader acceptance of spiritual dimensions in well-being research, which may have encouraged more interdisciplinary publications at that time. Figure 2 summarizes important information about the subject area by combining three different graphs.

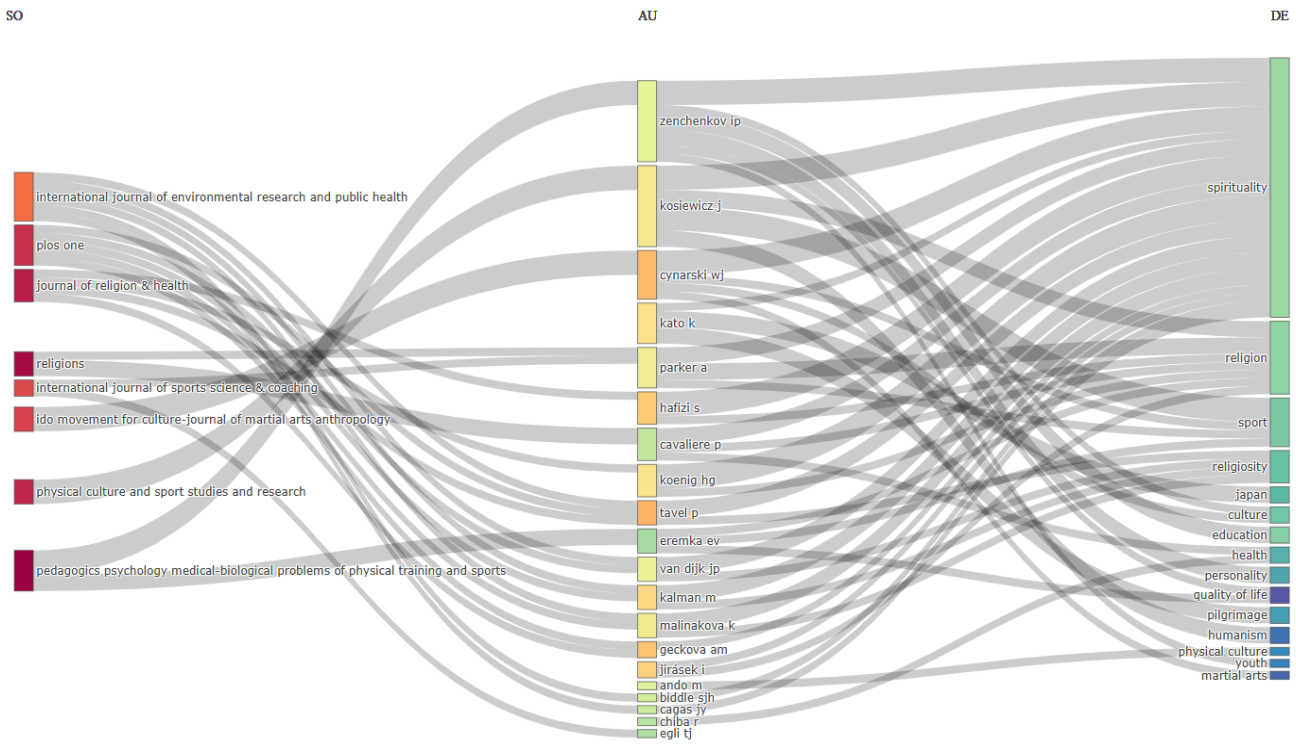


Figure 2. Three field graph

In Figure 2, the middle area shows the authors who have published the most on the topic, the right area shows the keywords used most by the authors, and the left area shows the journals that have published more studies on the topic. When Figure 2 is examined, it is seen that the authors named "Zenchenkov I. P.", Kosiewicz, J." and "Cynarski W. J." are important names in the field, the keywords "spirituality", "religion" and "sport" are frequently used by the authors and finally "International Journal of Environmental Research and Public Health", "Plos One", "Pedagogics Pscycology Medical-Biological Problems of Physical Training and Sports" journals are interested in the subject. Figure 3 shows the top 10 journals with the highest number of publications using the keywords “spirituality” and “sports”.

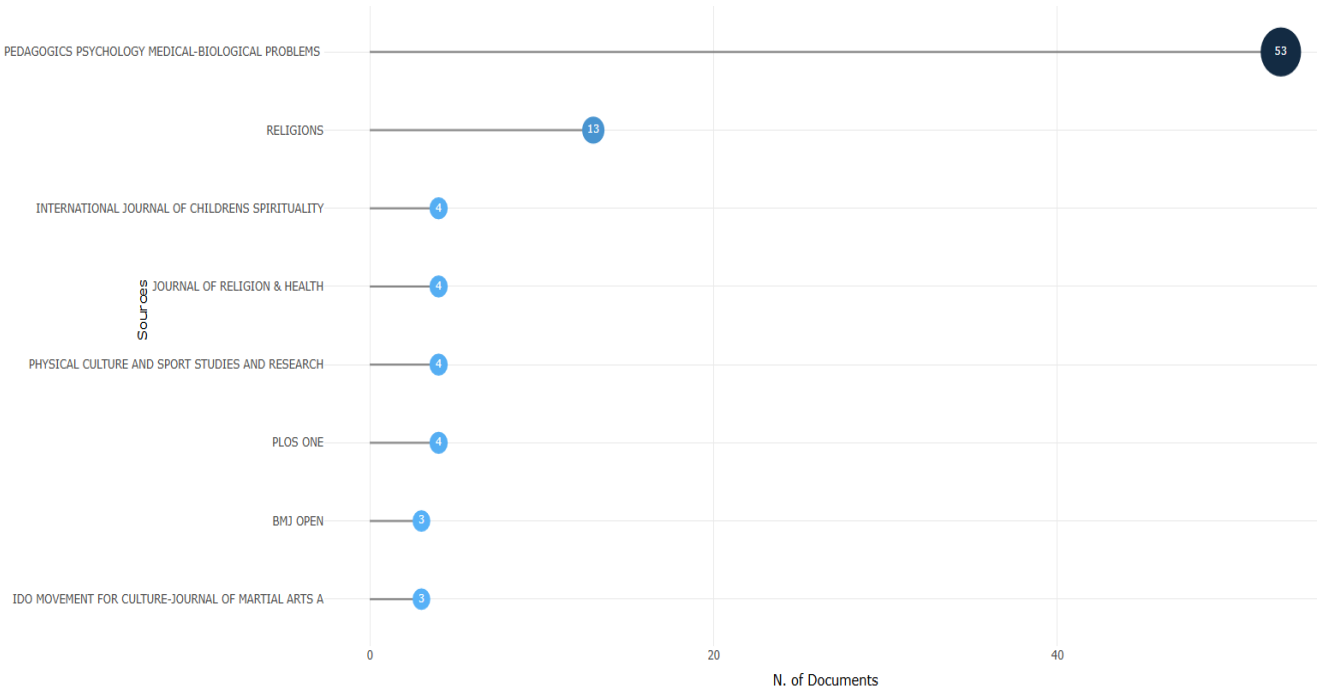


Figure 3. Most relevant sources

Pedagogics Psychology Medical Biological Problems of Physical Training and Sports (f=53), Religions (f=13) and International Journal of Childrens Spirituality, Journal of Religion &Health, Physical Culture and Sport Studies and Research and Plos One (f=4) are the sources where the studies were published the most. Figure 4 shows the top 10 most cited sources using the keywords “spirituality” and “sports”. J Pers Soc Psychol (f=54), J Relig Health (F=48), J Sci Stud Relig and Thesis (f=45) are the most cited sources.

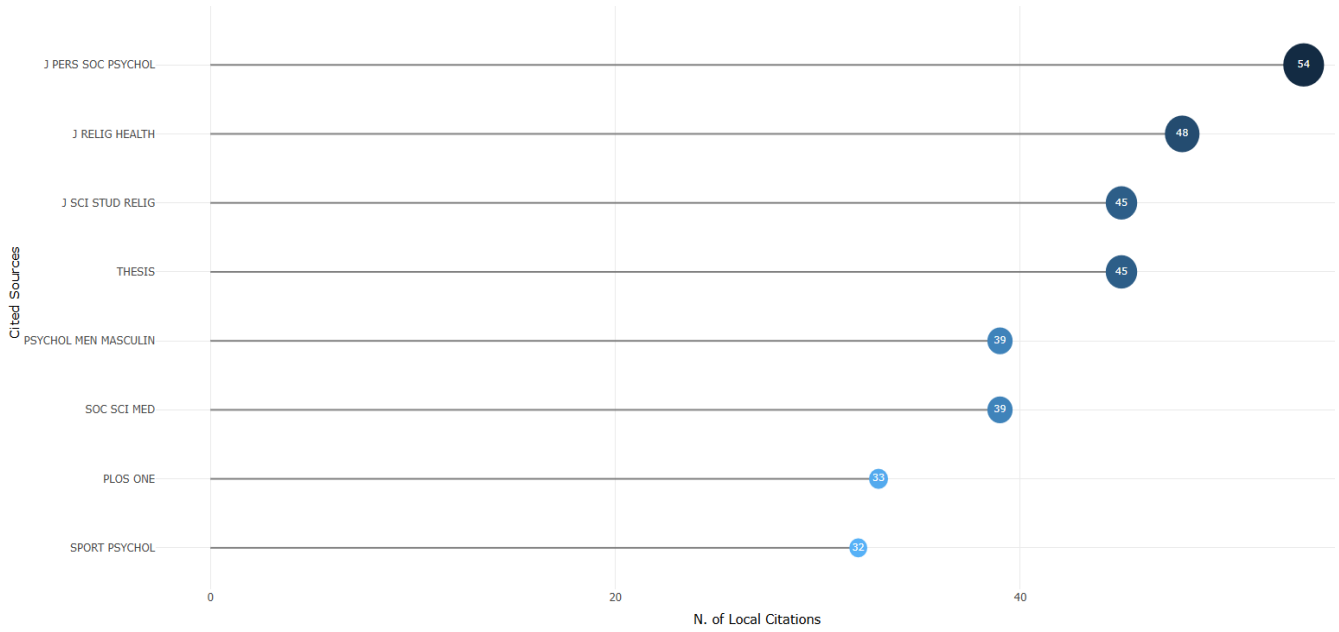


Figure 4. Most local cited sources

Figure 5 below shows that Tavel, P. (f = 4), Cynarski, W. J. (f = 3) and Geckova, A.M. (f = 3) are the authors who conducted the most studies on “spirituality” and “sports”.

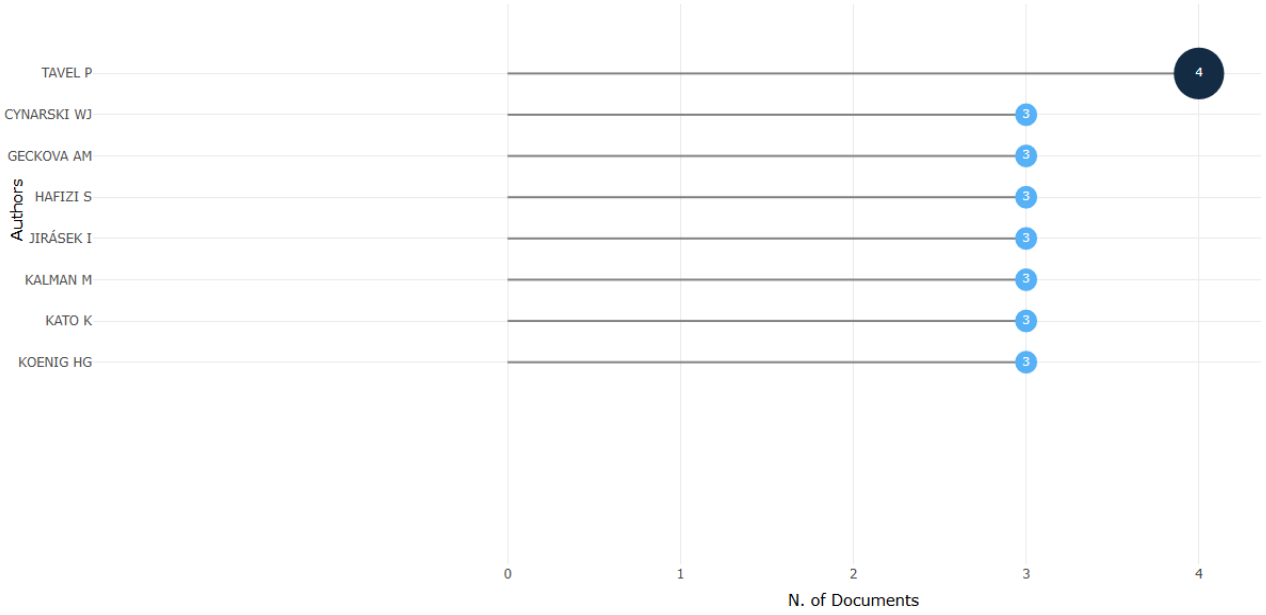


Figure 5. Most relevant authors

Figure 6 shows that the most cited authors on “spirituality” and “sports” are Jirasek, I. (f = 7), Connaughton D.P. (f = 3) and Hafızı, S. (f = 3), while Figure 7 shows the nationality of the authors who conducted the study.

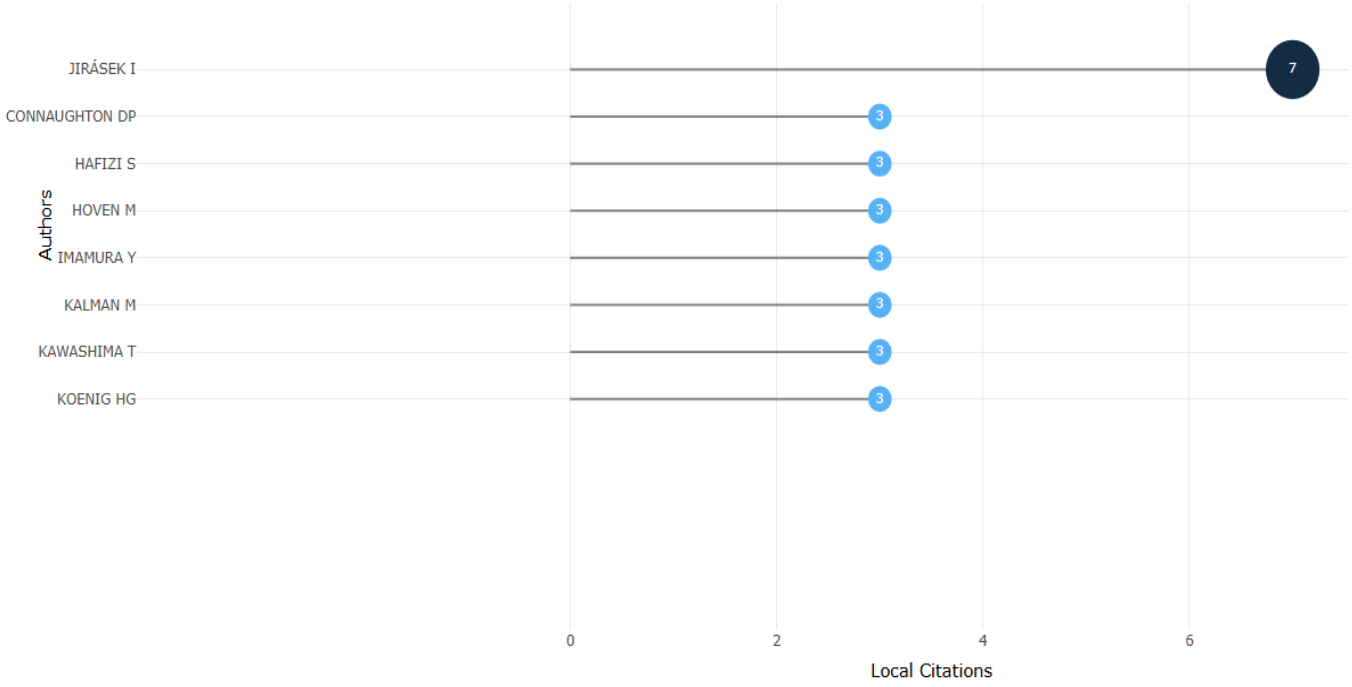


Figure 6. Most local cited authors

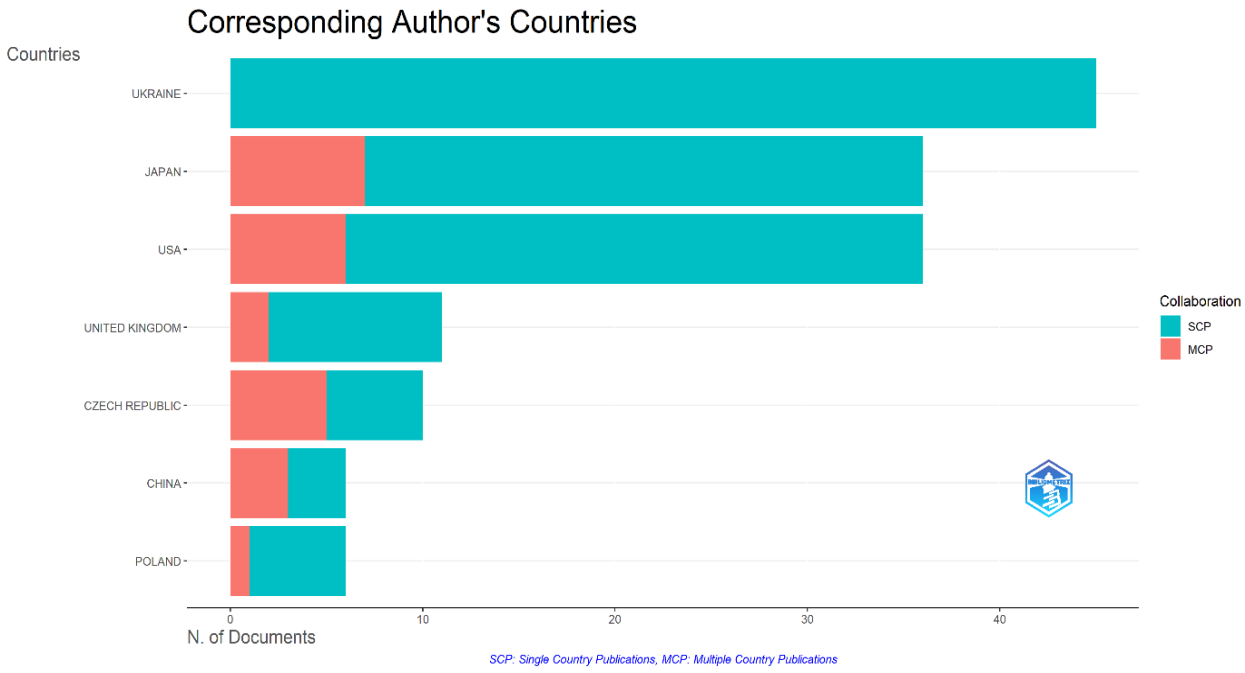


Figure 7. Corresponding author’s countries

When the nationalities of the contributing authors are analyzed, UKRAINE with 45 studies (SCP: 45), JAPAN with 36 studies (SCP: 29, MCP: 7), and USA with 36 studies (SCP: 30, MCP: 6) are in the first three places. Table 3 presents the scientific publication output by country, showing the frequency (Freq) of scientific contributions attributed to each country.

Table 3. Scientific production rate of countries

Region	n
Japan	112
USA	106
Ukraıne	50
UK	25
Czech Republıc	19
Chına	17
Brazıl	15
Germany	14
Spaın	14
Iran	13

When Table 3 is analyzed, Japan with 112 studies, USA with 106 studies, and Ukraine with 50 studies are the top three countries in scientific productivity. Figure 8 shows the most cited countries.

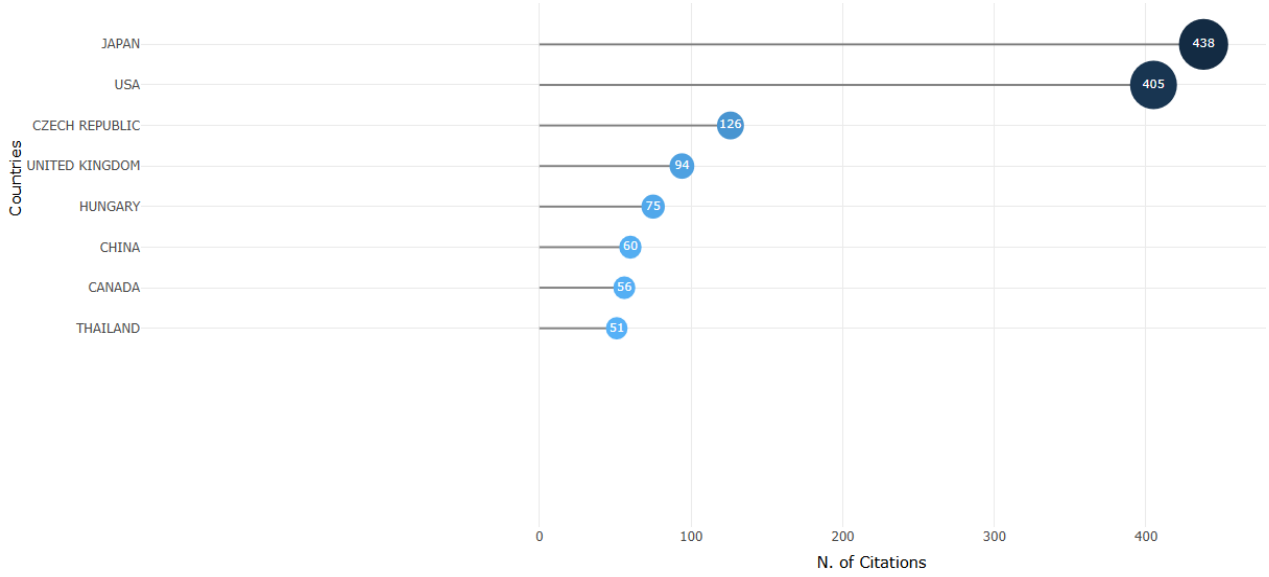


Figure 8. Most cited countries

When Figure 8 is analyzed; it is seen that the most cited countries globally related to the key concepts of "spirituality" and "sports" are Japan (f=438), USA (f=405), and Czech Republic (f=126). Figure 9 shows the most cited studies on "spirituality" and "sports".

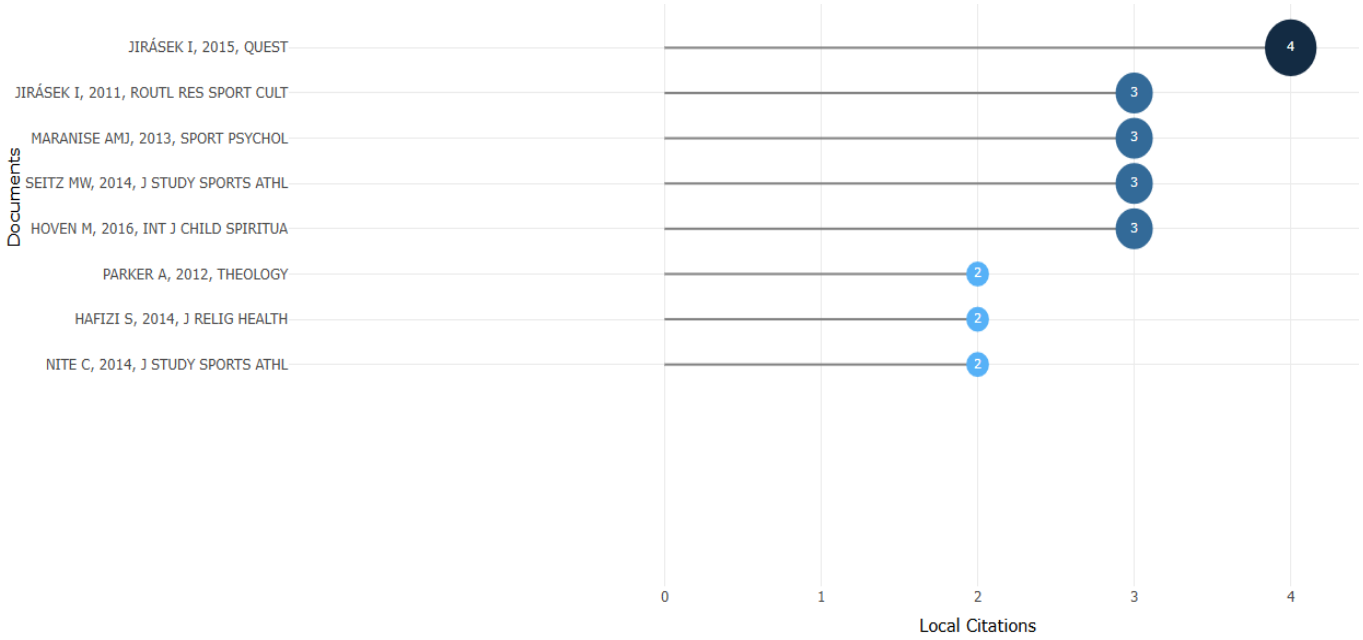


Figure 9. Most local cited documents

Figure 9 shows that the most cited studies on "spirituality" and "sports" are Jirasek, I. 2015, Quest (f = 4), Jırásek I, 2011, Routl Res Sport Cult (F = 3), Maranıse Amj, 2013, Sport Psychol (F = 3), Seıtz Mw, 2014, J Study Sports Athl (F = 3), Hoven M, 2016, Int J Child Spiritua (F = 3). Information on the most frequently used keywords in the research is shown in Figure 10 and Figure 11.

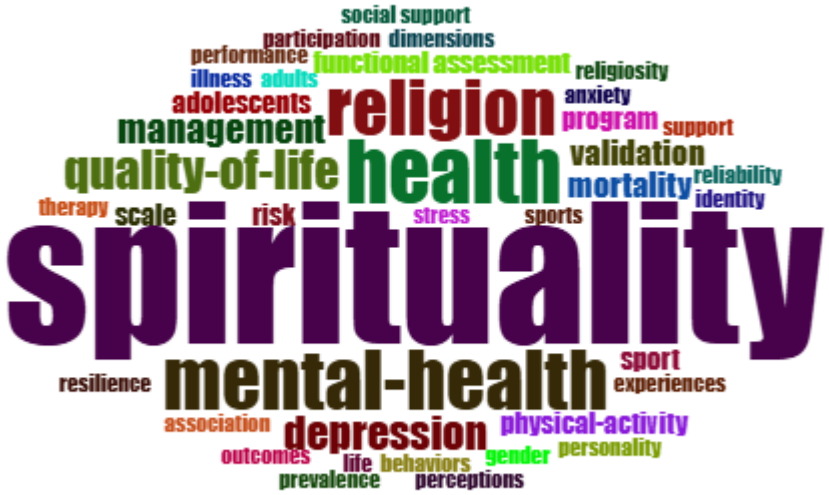


Figure 10. Word cloud

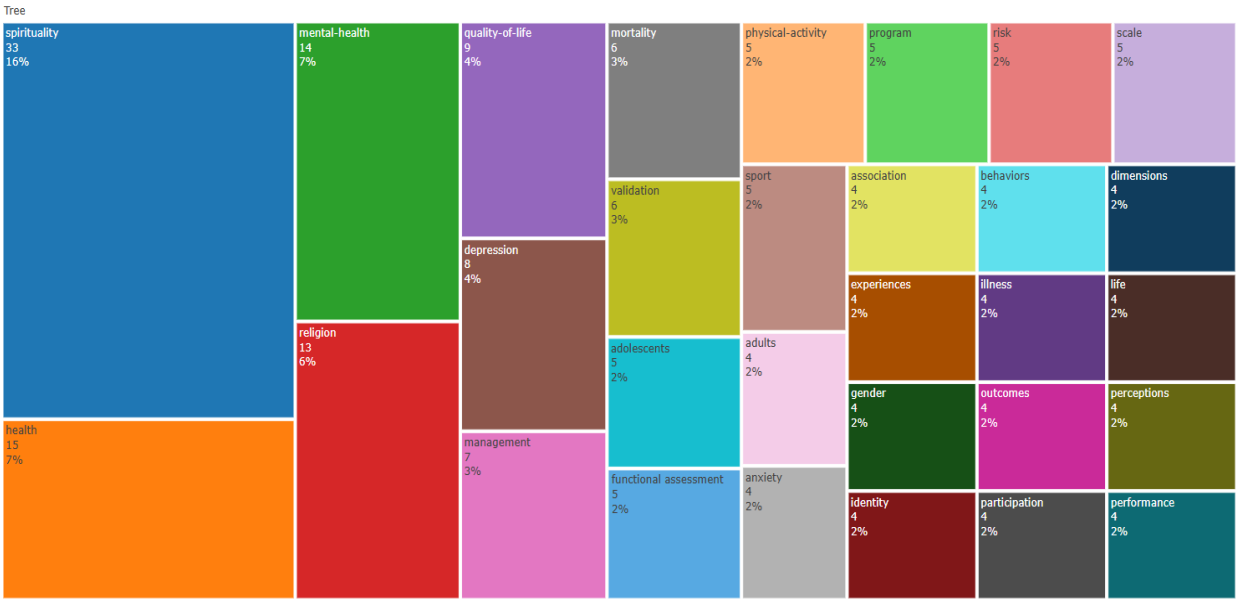


Figure 11. Word tree

Figure 10, called a word cloud, shows the most frequently used words in a text or phrase. The most frequently used word related to the subject area is shown in the center. The words used are specific to the topic area, as can be seen from the size of the words and their placement near the center. As the word size decreases and moves out of the center, the word is used less frequently.

When Figure 11, which is called the word tree, is examined, it is seen that the most frequently used words are spirituality (f=33), health (f=15) and mental health (f=14). Figure 12 illustrates the keyword co-occurrence network, highlighting spirituality, religion, and sport as the most frequently interconnected term

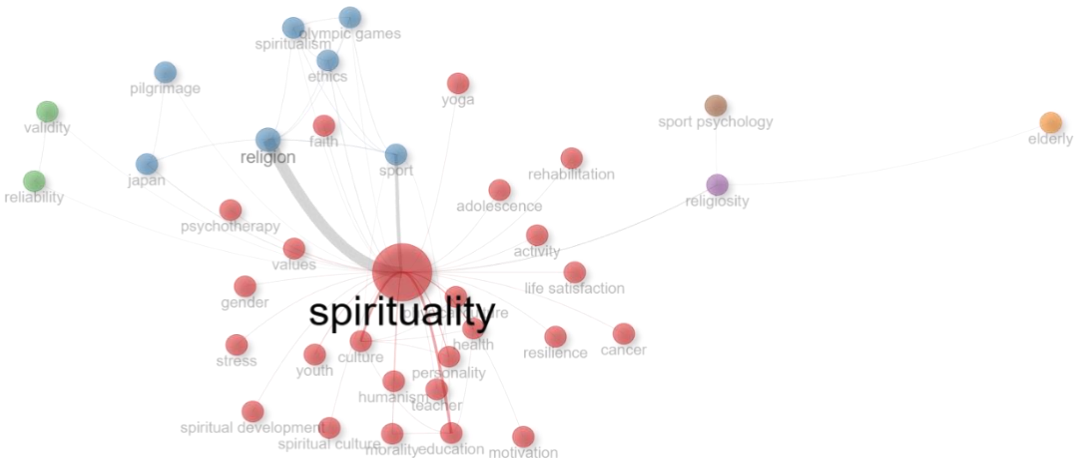


Figure 12. Co-occurrence network

When Figure 13 is examined, it can be said that the main themes in the lower right section are used as keywords in the studies conducted on this subject, the themes in the upper right section are the pioneering themes of this subject and these concepts have been used more in the studies conducted in recent years.

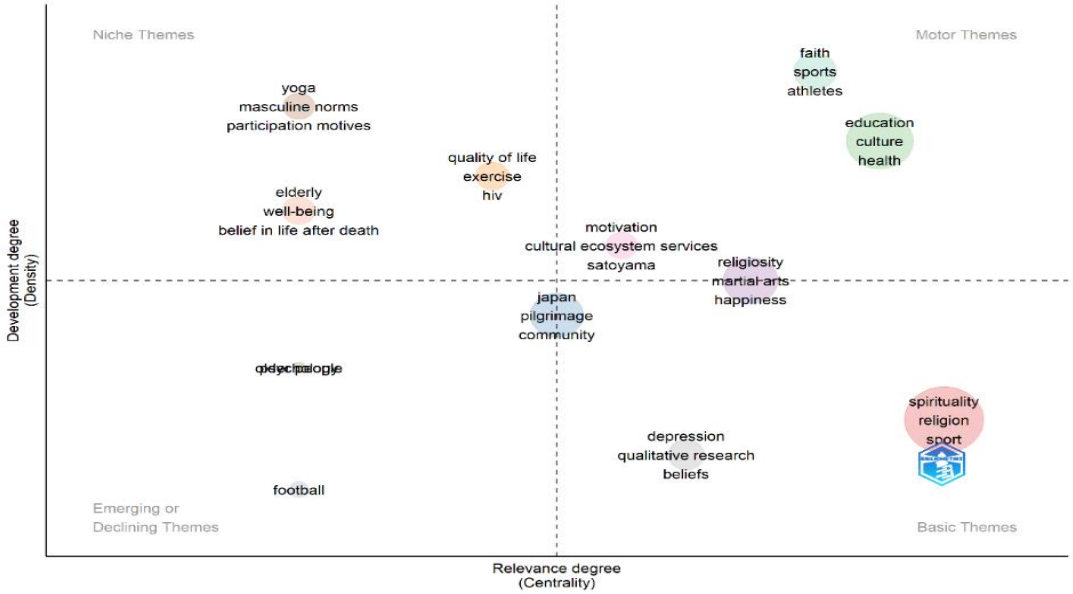


Figure 13. Tematic map

It is seen that there are developing or regressing words in the themes in the lower left section, while the upper left section has not been studied much within the framework of emerging themes.

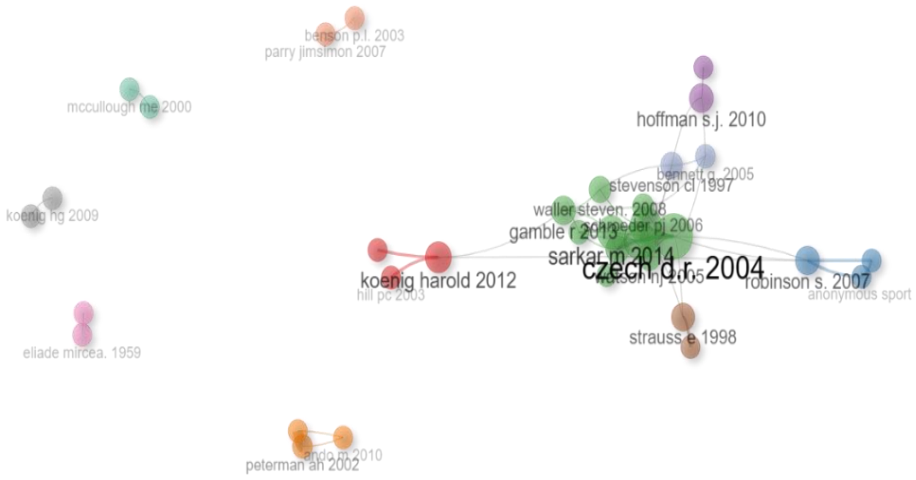


Figure 14. Co-citation network

Bibliometric network analysis based on co-citation models is a method that visualizes the relationships between scientific documents. Co-citation occurs when two documents are cited simultaneously by a third document, indicating a connection or similarity between them. Co-citation networks provide important information about the intellectual structure, knowledge diffusion and research relationships in a given field. In such a network, each node represents a scientific document (e.g. a journal article), while the edges between nodes represent co-citation relationships. If two documents are frequently cited together, they are considered to be closer in terms of content, ideas or research topics. Thus, Czech, 2004 is seen as the most influential and co-cited authors in the first cluster, Sarkar, 2014 in the second cluster, and Koening, 2012 in the third cluster.

4. DISCUSSION

In this study, the Web of Science (WoS) database, which provides access to international publications and citation indexes, was searched using the keywords “spirituality” and “sports”. Bibliometric analysis was performed on a total of 226 studies using R Studio program with certain limitations applied in line with the purpose of the study. In addition to the distribution of the studies according to years, conceptual structures related to the most publishing journals, most publishing

authors, scientific productivity of countries, most cited articles, and collaboration networks were identified.

The data obtained using word cloud and word tree methods show both the keywords used in the searches on the subject and the concepts that researchers use most frequently in their abstracts. When these findings are examined within the scope of the current study, it is seen that researchers associate the fields of spirituality, health, mental health, quality life, religion with the subject of sports. These findings are consistent with previous bibliometric studies that have emphasized the potential of mapping techniques in uncovering thematic shifts in specialized fields (Donthu et al., 2021; Gutiérrez-Salcedo et al., 2018). However, this study extends the scope by focusing on the relatively unexplored intersection between spirituality and sport. The observed increase in the use of keywords such as “mental health,” “resilience,” and “well-being” in the co-occurrence network suggests a conceptual integration of spiritual values into athlete development. This indicates an evolving theoretical perspective within sport psychology, where spiritual constructs are increasingly seen not only as coping tools, but also as central to identity formation and motivation in athletic contexts.

These results underscore the need for integrating spirituality-related constructs into mainstream sport psychology frameworks such as Self-Determination Theory, which emphasizes intrinsic motivation and psychological well-being (Deci & Ryan, 2000). The prominence of keywords like “mental health” and “resilience” in the co-occurrence analysis suggests that spirituality in sport is increasingly conceptualized not just as a coping mechanism, but as a central dimension of athlete identity and psychological functioning. Future theoretical work may benefit from adapting such constructs within models of athlete performance and holistic development.

5. CONCLUSIONS

This bibliometric analysis reveals the increasing academic interest in the concepts of “spirituality” and “sports”. Between 1996 and 2023, there was a significant increase in the number of studies on the subject in 2005, followed by a decline until 2014, and a certain level of increase was observed between 2014 and 2023, although there were fluctuations in the number of studies. The journal “Pedagogics Psychology Medical Biological Problems of Physical Training and Sports” is the most widely published source in this field, while Japan, USA and Ukraine are the leading countries in scientific productivity. The key terms “mental health,” “religion” and “health” came to the fore and it was emphasized that the relationship between sport and spirituality in this field should be examined

in more depth academically. When the thematic map is examined, it is seen that the topics in the upper left section represent unstudied or understudied areas. These areas shed light on new research topics that can offer different perspectives in the literature combining sport and spirituality. In particular, topics such as "spiritual perspective on quality of life," "sport and spirituality in older individuals," and "the role of spirituality in sport team dynamics" stand out as important gaps in the literature. While the findings indicate that there is a significant potential in the intersection of these two disciplines, they also provide various suggestions for future research and reveal the need for the development of the literature in this field.

5.1. Limitations

This study has several limitations. First, the analysis was limited to the Web of Science database, which, although comprehensive, does not cover all academic journals and may introduce database selection bias. Future studies could incorporate Scopus, PubMed, or Google Scholar to ensure broader coverage. Second, the interpretation of keyword frequencies and thematic groupings is dependent on author-assigned terms and terminological inconsistencies may affect clustering outcomes. Third, while bibliometric techniques offer valuable macroscopic insights, they do not assess the quality or theoretical content of individual studies. A future systematic review or meta-synthesis may help fill this gap.

6. RECOMMENDATIONS

Based on the results of the study, the following recommendations may contribute to the development of a more comprehensive and effective literature that combines the fields of "spirituality" and "sport":

- An In-Depth Study of the Relationships between Sport and Spirituality: Through further qualitative and quantitative research, the psychological and social influences between these two fields can be better understood.
- Thematic Expansions: Focus more on sub-themes such as "yoga", "masculine norms", "motives for participation", "quality of life exercise, hiv", "elders, well-being, belief in afterlife".
- Use of Different Databases: The scope of studies can be expanded with data obtained from alternative databases such as Scopus and Proquest.
- Multidisciplinary Approaches: Multidisciplinary studies in which religion, psychology, sports sciences and health fields are examined together can provide richer data sets and scope.

- Applied Research: Applied studies examining athletes' spiritual experiences and their effects on performance can provide practical knowledge.

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CONFLICTS OF INTEREST

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