Development of Sports Psychology Research and Athlete Performance in Reputable International Journals: Bibliometric Analysis

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Abstract This study aims to be able to map the scope of sports psychology research on the Scopus scientific article database. The research focus to describe the thematic areas that most attract the attention of academics, to analyze the development of research on sports psychology which is associated with athlete performance. This research method is descriptive quantitative with a bibliometric approach, assisted by Publish or Perish and VosViewers software. Research sample from the last two decades (2002-2022). Through the keywords "sports psychology" and "performance" in the "article title" found 59 articles. The results of the study show that research trends regarding sports psychology and athlete performance have increased. The fields that have most attracted the attention of academics are sport psychology, applied sport psychology, ethics, and athletic performance. The most frequently discussed topics are sport psychology, performance excellence, and applied sport psychology. Meanwhile burnout, athlete, exercise, ethics, mental skills, performance, talent, and expertise are topics that are rarely discussed. More in-depth research on topics that are rarely discussed can be carried out by other researchers.

Keywords: *sports psychology, athlete performance, bibliometrics, vos viewer*

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INTRODUCTION

Sports psychology is an applied discipline that studies human behavior in sports. In general, psychology is a scientific and applied field that studies human behavior as individuals and relationships with the environment (Supriyanto, 2015). In relation to sports, the behavior that is learned is human behavior in a sports environment.

The application of psychology in sports aims to help develop talent and solve mental problems in sports. The goal of sports psychology is to study the psychological factors that influence performance and understand how participation in sports affects individual development (Kurniawan, Ari Wibowo., Adi Wijayanto, 2017).

This is confirmed by (Liew et al., 2019) who reported that the contribution of psychological aspects is more than 50% to the success of athletes when competing. The psychological aspect has an influence of 80% (Aliyyah et al., 2020). Therefore, psychological aspects need to be properly trained and developed during the athlete coaching process. There are several psychological aspects that affect performance during training and competition such as self-confidence, self-evicacy, concentra-tion,

motivation, anxiety and mental toughness (Zetou et al., 2012). Sports psychology as well as coaching science, sports physiology, or sports nutrition is an important factor that determines athlete performance. Good athlete psychology can be seen during matches such as the increased ability of athletes to accept stress, being able to concentrate, having mental toughness so that they can overcome heavier challenges (Sukadiyanto & Muluk, 2011).

Some of the benefits of sports psychology in improving athlete performance are being able to explain and understand athlete behavior and psychological symptoms that occur in sports in general, being able to predict or make predictions correctly about the possibilities that can occur in athletes (Effendi, 2016).

The positive benefits provided by the application of sports psychology to athlete performance have been widely proven through research conducted. Also psychological ability of athletes can handling stress recovery in athletes when competing (Dewi, 2022).

Research is a scientific activity that greatly influences the development of science, including sports psychology.

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Evaluation of research results also needs to be carried out to provide an overview of developments and aspects that have been widely studied and those that are still little or not yet studied. The effectiveness of the process of evaluating or reviewing the results of the research carried out depends on the availability and accuracy of the available data. This can be obtained from the results of scientific research publications sourced from reputable journals. The methods that can be used in this evaluation process are bibliometric analysis.

Bibliometric analysis is a method of evaluating scientific research results. Bibliometric analysis is an effective statistical evaluation of scientific articles, books, or chapters of a published book, including measuring the influence of publications in the scientific community (Iftikhar et al., 2019) . The purpose of evaluation with bibliometric analysis can be done to find out related to interactions, mapping, or find out the development of science. The results of scientific research published in reputable journals both nationally and internationally are increasing every day. To be able to evaluate the results of scientific research that has complex information requires a relatively long time. Therefore, bibliometric analysis can be used as a way for the desired evaluation process.

Related to the development of scientific research in the field of psychology and considering the important role of sports psychology in athlete performance. An evaluation is needed to be able to map the results of sports psychology research. Research results that have been published in reputable journals may be limited to Scopus indexed publications. Scopus is the largest collection of literature in the world, with citations that provide abstracts from various scientific literature and research that has been reviewed (Tupan et al., 2018).

Scopus has very strict requirements and selection. Scopus indexed publication categories include Journal policy, Content, Journal standing, Regularity, and Online availability (Elsevier, 2023). Research related to the development of sports psychology research and athlete performance in reputable international journals in the last two decades from 2002 to 2022 has never been carried out.

This study aims to be able to map the scope of sports psychology research

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on the Scopus scientific article database. The research focus is to describe the thematic areas that most attract the attention of academics, to analyze the development of research on sports psychology which is associated with athlete performance.

METHOD

The method in this study is descriptive quantitative with a bibliometrics approach, which is assisted by Publish or Perish software to search for data and VosViewers to analyze it. Bibliometrics helps in studying and identifying patterns of material use and analyzing the development of a specific literature, especially for authorship, publication and use (Reitz, 2004). By using the bibliometrics approach, an overview of journal quality, journal maturity, journal productivity and so on regarding articles in journals will be obtained (Saleh & Sumarni, 2016).

The research sample was taken from the Scopus database as a data source for the last two decades, namely the 2002-2022 period. Using the Publish or Perish application, through the keyword "sports psychology" in the "article title" found 139 research articles.

Meanwhile, through the keywords "sports psychology" and "performance" in the "article title" found 48 articles. Researchers limit the sources of articles that only come from journals and proceedings. The number of articles obtained was 139 research articles, the articles that were appropriate and analyzed were 48 research articles.

Data presentation, using data visualization with the help of the VOSViewer application. Parameters used in VOSViewer to obtain article metadata include 1) Type of analysis (co-occurrence analysis); (2) Unit of analysis (All keywords); (3) Calculation method (Full count); and (4) Minimum number of author documents (2 documents) (Jeong & Koo, 2016).

RESULT AND DISCUSSION

Based on the search results for articles from the Scopus database for the last two decades using the Publish or Perish application regarding "sports psychology" in the title of the article, 139 research articles were found. Meanwhile, by using two keywords namely "sports psychology" and "performance" in the title of the article found 59 articles.

In addition, from the search results there were 36 publishers who

published articles on sports psychology and performance. The four publishers that published the most articles on sports psychology and performance were the Journal of Sport Psychology in Action with a total of 7 articles published. The International Journal of Sport and Exercise Psychology which published 5 articles, Revista de Psicologia del Deporte which published 4 articles, and Sport, Exercise, and Performance Psychology with 4 articles. Below in figure 3 is presented the percentage of the four most publishers who publish articles on sports psychology and performance.
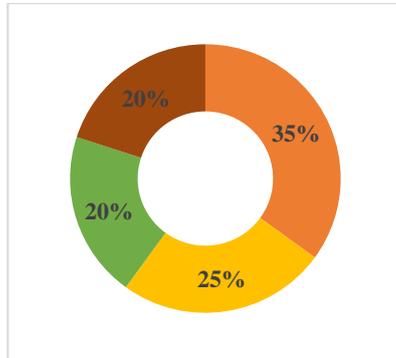

Figure 1. Percentage of 4 publishers that published the most articles on sports psychology and performance in the last two decades

Besides the number of publishers who published the highest number of articles, based on the search results there were also 5 articles on sports psychology and performance which had the highest number of citations in the last two decades. The following table 1 presents the Top 5 articles with the highest citations.

Table 1. Top 5 highest-cited articles on sports psychology and performance within the last two decade

Author	Article	Cites/ Year	Publisher
C. Swann	Defining elite athletes: Issues in the study of expert performance in sport psychology	458/ 2015	Psychology of Sport and Exercise
R.J. Schinke	International society of sport psychology position stand: Athletes' mental health, performance, and development	198/ 2018	International Journal of Sport and Exercise Psychology
R. Schinke	Sport psychology services to high performance athletes during COVID-19	78/ 2020	International Journal of Sport and Exercise Psychology
C.M. Janelle	Visual attention and brain processes that underlie expert performance: Implications for sport and military psychology	63/ 2008	Military Psychology
M. Lochbaum	A meta-analytic review of the approach-avoidance achievement goals and performance relationships in the sport psychology literature	61/ 2015	Journal of Sport and Health Science

In searching for data regarding sports psychology and performance using Publish or Perish, you can not only analyze it through Microsoft Excel, but you can also analyze it using VosViewers to get other data. In carrying out the analysis using VosViewers, the 59 article metadata that have been obtained are stored in the form of RIS files.

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There are 3 visualizations displayed by VosViewers including network visualization, overlay visualization and density visualization presented in Figures 2, 3 and 4. Based on Figure 2, the results of the related or relevant terms displayed on the network visualization have 6 different clusters.

Table 2.

The division of clusters is based on the relationship between items

| Cluster/ color	Items
1/ Red	athletic performance, athletic psychology, burnout, exercise, psychology, sport
2/ Green	adult athletes, applied sport psychology, mental skills, professional development
3/ Navy	ethics, performance enhancement, sport psychology consulting
4/ Yellow	sport psychology, performance psychology, sport psychology
5/ Purple	sport psychology, sports performance, sports psychology
6/ Blue	expertise, performance, talent
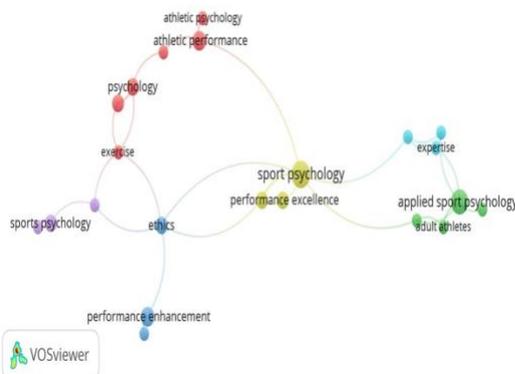
Figure 2. Network Visualization

Then, the results of the 23 related or relevant terms are visualized again by relating each term based on the year it was published. The range of years for grouping starts from 2014 down to 2022.
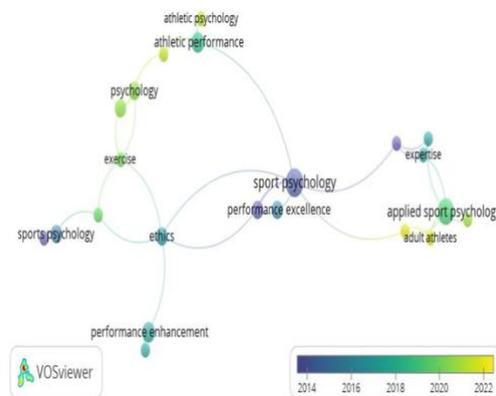

Figure 3. Network visualization

Table 3.

The division of clusters is based on the year

| Year/ claster	Items
< 2016/ Purple	sport psychology, performance psychology, performance, sports performance, ethics
2016 – 2019/ Tosca	performance enhancement, sport psychology consulting, ethics, psychology, talent, expertise
2019 – 2021/ Green	athletes, exercise, sport, sport psychology, applied sport psychology, professional development, athletic performance
2021- 2022/ Yellow	adult athletes, mental skills, burnout, athletic psychology
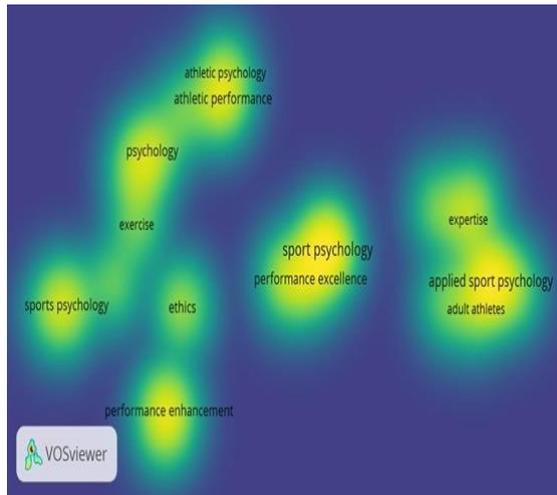
Figure 4. *Density visualization*

Next is the density visualization. The density visualization display of the 23 related terms has several different clusters grouped according to their brightness level. The distribution of these clusters is presented in table 4.

Tabel 4.

Cluster division based on brightness level

Color	Items
Bright	sport psychology, performance exellence, applied sport psychology
Bright Enough	athletic psychology, athletic performance, performance enhancement, sport psychology consulting, psychology, sport, sports psychology, adult athletes
Not bright	burnout, athlete, exercise, ethics, mental skills, performance, talent, expertise.

Based on the results of the data obtained using the Systematic Literature Review (SLR) method regarding sports psychology which is associated with athlete performance from an interval of the last 20 years, namely from 2002 to 2022, this research trend has increased, which means that there is high interest in taking this study.

Sports psychology associated with athlete performance. Research on sports psychology and athlete performance really needs to be developed as a useful reference in the process of coaching athletes in the aspect of athlete mental development and training.

Research on sports psychology and athlete performance has been published by several international publishers. There are 4 publishers with the highest number of published articles, namely Journal of Sport Psychology in Action, International Journal of Sport and Exercise Psychology, Revista de Psicologia del Deporte, and Sport, Exercise, and Performance Psychology.

Judging from the four publisher names that published the most articles on sports psychology and athlete performance, it was the publisher that

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covered the theme of sports psychology publications. Most researchers publish their articles in publishers that are in accordance with the research themes that have been carried out. The publisher that published the most articles on sports psychology and athlete performance was the International Journal of Sport and Exercise Psychology with a total of 7 publications. Furthermore, there are several research articles on sports psychology and athlete performance which have the highest number of citations in the last 20 years, starting from 2002 to 2022. The highest number of citations can be seen in table 1, of the 5 articles with the most citations, along with the title of the article and the author who has the highest number of 3 citations in the last 20 years.

Researcher C. Swann with his article entitled Defining elite athletes: Issues in the study of expert performance in sport psychology, published in 2015 in Psychology of Sport and Exercise, has been cited 458 times. This article presents the results of research aimed at critically evaluating the ways in which elite/expert athletes have been defined in recent research in sports psychology, explores the reasons for using these athletes, and evaluates the conclusions drawn by research in this area about the nature of skill (Swann et al., 2015).

Then the second article entitled International society of sport psychology position stand: Athletes mental health, performance, and development which was written in 2018 by R.J. Schinke, et al in the International Journal of Sport and Exercise Psychology has a total of 198 citations. In his article (R. J. Schinke et al., 2018) explained definitions and theories to research and practice regarding the phenomenon of mental health, athlete performance, career and personal development, and interventions aimed at monitoring and maintaining the mental health of athletes. In the time of covid in 2020.

Next, an article entitled Sport psychology services to high performance athletes during COVID-19 by (R. Schinke et al., 2020) published in the International Journal of Sport and Exercise Psychology and has been cited 78 times. It can be seen that the topics of the articles that have the most citations are very interesting and fundamental topics to be used as references so that they are used as a reference for other researchers who conduct research on the

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theme of sports psychology and athlete performance.

In addition to the author data above, an analysis using VosViewers from 59 article metadata obtained summarized some of the most prolific authors who write on the theme of sports psychology and athlete performance. In Figure 4, you can see the top 3 authors who published the most articles, namely Aoyagi, Mark W., Cohen, Alexander B., and Si, Gangyan.

Dr. Mark W. Aoyagi is the Co-Director of Sport & Performance Psychology and Professor in the Graduate School of Professional Psychology at the University of Denver who has published 5 (five) articles on sports psychology and athlete performance. Cohen, Alexander B actively mentored Sr.

Sport Psychologist at the United States Olympic & Paralympic Committee, is the second prolific writer with 4 (four) published articles. Gangyan Si is a professor of sports psychology at the Wuhan Institute of Physical Education, China, who has actively published research results on the theme of sports psychology and athlete performance in 3 articles. In the VosViewers analysis, visualization of

149 relevant topics was also obtained related to 59 article metadata regarding sports psychology and performance. The metadata obtained is visualized based on network visualization, overlay visualization, and density visualization. The results of the 59 relevant terms on the network visualization display are divided into 6 different clusters. In this section, the meaning of a cluster is a group or set of data objects that are similar to one another in the same cluster and are dissimilar to different objects (Darmi & Setiawan, 2016). So that researchers can observe terms that are connected to each other according to the topic on this network visualization display. If the terms have a thick trajectory and the terms circle is large this means that the terms have a strong relationship. In Figure 6 it can be seen that there is a strong relationship between the terms sport psychology, applied sport psychology, ethics, and athletic performance.

Then the grouping based on the year the article was published can be seen in the overlay visualization results. There are 4 different colors where the colors start from the dark color which is shown as purple to the light color which is shown as yellow. The lighter the base

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color for each word indicates the publication of the article is closer to the latest year.

Based on table 3 it can be seen the popular terms discussed in the last 20 years. Before 2016 the topics that were often discussed by researchers were sport psychology, performance psychology, performance, sports performance, and ethics. From 2016-2019 the topics discussed are still related to previous years but more specifically, namely performance enhancement, sport psychology consulting, ethics, psychology, talent, and expertise.

The topics discussed by researchers related to sports psychology and athlete performance in 2019-2021 are expanding, including athletes, exercise, sport, sport psychology, applied sport psychology, professional development, and athletic performance. Whereas in 2021-2022 the topics that often arise are related to sports psychology and athlete performance which are associated with adult athletes, mental skills, burnout, and athletic psychology. This will assist other researchers in taking research sub-themes on sports psychology and the performance of the athletes to be studied.

The results of the density visualization display the relevant terms grouped according to their brightness level or density. Can be seen in Figure 8, there are 3 different clusters where there are brightness levels, namely bright, quite bright, and not bright. The lighter the base color for each word indicates the level of saturation in high research or the topics that have been discussed a lot. In table 4 it can be seen that the topics of sport psychology, performance excellence, and applied sport psychology are the most frequently raised topics in research. Meanwhile, if the brightness level is dimmer, then fewer researchers are discussing the topic. In this case, the topics that were the least discussed were burnout, athlete, exercise, ethics, mental skills, performance, talent, and expertise.

Based on the presentation and discussion of the results of the analysis of 59 metadata articles regarding sports psychology and performance with the help of Publish or Perish (PoP) which were studied using Microsoft Excel and Vos Viewers, the researchers obtained results regarding the development of research on these two topics in the last 20 years starting from from 2002 to 2022.

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The results of the discussion from mapping the scope of research in the field of sports psychology and athlete performance on the Scopus scientific article database can later be used by other researchers to examine more deeply about these two topics. Studies that can be carried out by other studies are in the form of the effect of implementing psychological training on athlete performance, especially in tackling the problem of stage fright and also in post-competition recovery.

CONCLUSION

Based on the results and discussion described above, it can be concluded that the trend of research articles on sports psychology and athlete performance in 2002-2022 has experienced an increase in the number of publications. This shows the interest or interest of researchers in studying sports psychology and performance. The thematic areas that have most attracted the attention of academics are the terms sport psychology, applied sport psychology, ethics, and athletic performance.

In the last 20 years, the development of research on sports psychology which is related to athlete performance, most often raises the topic of sport psychology, performance excellence, and applied sport psychology. Meanwhile burnout, athlete, exercise, ethics, mental skills, performance, talent, and expertise are topics that are rarely discussed. With the Systematic Literature Review (SLR), the researcher suggests other researchers to conduct more in-depth research on topics that are rarely discussed in the field of sports psychology and athlete performance. Likewise, a Systematic Literature Review (SLR) study on sports psychology can be carried out in conjunction with other research topics.

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