INDONESIAN JOURNAL OF SPORT MANAGEMENT
Department of Physical Education, Universitas Majalengka, Indonesia
ISSN 2776-706X.

Bibliometric Analysis of Management Approaches in Optimizing Athlete Potential in Badminton

Ajis Sumantri[1A-D], Dody Ertanto[2BD*]

[12] Undergraduate Physical Education Study Program, Universitas Dehasen Bengkulu, Indonesia

ABSTRACT

This study aims to determine the contribution of arm muscle strength to serving This research aims to conduct a bibliometric analysis of management approaches to optimize the potential of athletes in badminton. Through searching and selecting articles from various trusted sources, we analyze research trends, main focuses, and developments in management approaches to improve the performance of badminton athletes. The results of the analysis show that there has been increasing research interest in this topic over the past several decades, focusing on team development strategies, time management, mental training, and the use of technology in coaching athletes. In addition, identifying key concepts such as leadership, motivation, and competitive strategy is also a major highlight in the literature. The practical implications of these findings include the importance of implementing a holistic and sustainable management approach to optimize the potential of badminton athletes. This study provides valuable insights for sports practitioners, coaches and researchers to continue developing effective strategies for advancing athlete performance in badminton.

Keywords: Athletes; Badminton, Bibliometric, Scopus

Corresponding author:
*Dody Ertanto, Undergraduate Physical Education Study Program, Universitas Dehasen Bengkulu, Indonesia.
Email: dodyertanto88@unived.ac.id

Article History:
Submitted: January, 2024
Accepted: February, 2024
Published: February, 2024

Authors' contribution:
A) Conception and design of the study;
B) Acquisition of data;
C) Analysis and interpretation of data;
D) Manuscript preparation;
E) Obtaining funding.

Cite this article:
Sumantri, A. & Ertanto, D. (2024). Bibliometric Analysis of Management Approaches in Optimizing Athlete Potential in Badminton. *Indonesian Journal of Sport Management*, 4(1), 67-74
https://doi.org/10.31949/ijsm.v4i1.8891

INTRODUCTION

Athletes who want to compete in the physically demanding racquet sport of badminton must be adept at both technical skill and strategy in addition to physical condition. Research shows that strength training is a meaningful way to improve physical performance (Gallardo et al., 2023), plyometric training, and electromyostimulation (Zhang, 2023). Furthermore, research highlights the need for a high level of physical fitness, namely VO2 max, for optimal badminton play. Training approaches such as competitive circuits and continuous training raise VO2 max (Panda et al., 2022). Furthermore, badminton requires quick footwork, emphasising the importance of psychological skill training in addition to physical preparation for better performance Ariani et al., 2022). For this reason, athletes must develop their technical skills, strategic insight, and physical condition to succeed in the physically demanding game of badminton.

Coaches, sports scientists, and management experts now view optimising player potential as a critical goal as the sport's popularity and competitiveness continue to

rise. Athletes must attain maximum performance levels, retain their professions, and maintain their general well-being. Given the growing popularity and level of competition in modern sports, it is imperative to maximize athlete potential. Coaches, sports scientists, and management specialists value athletes' general well-being, professional careers, and reaching peak performance levels. Supporting athletes in achieving these goals requires effective management techniques. Numerous scholarly investigations have emphasized the need to optimize player potential. For example, game theory research has demonstrated that maximizing how businesses and foreign partners interact can result in more advantages from entering new markets Rudnichenko et al., 2019). Likewise, by streamlining player management procedures in athletics, healthcare process enhancements may be applied to improve athlete performance and well-being (Ranaweera et al., 2021). This requires effective management strategies.

The sports management sector has recently witnessed a surge in interest in evidence-based techniques that improve athlete performance. Bibliometric analysis is a research approach that provides essential insights into the trends, patterns, and effects of different management practices. It does this by analysing academic literature using quantitative tools. Using this technique, researchers may find critical studies, hot subjects, and gaps in the body of knowledge, which helps direct their future work. This research aims to provide a bibliometric analysis of the body of knowledge about management strategies intended to maximise player potential in badminton. Through this perspective, we want to reveal promising pathways for future study, highlight the most successful management practices, and indicate critical areas of concentration within the body of research. In addition to adding to the body of knowledge on badminton sports management, this study will give coaches and sports managers helpful advice on improving player performance.

Using this bibliometric technique, we want to address the following essential questions: What are the most common management techniques used in badminton to maximise the potential of athletes? How has the field of research changed throughout time? Which writers and studies have influenced this field the most? This research seeks to close the knowledge gap between theory and practice by tackling these issues and thoroughly reviewing how management techniques may be improved to improve badminton player performance.

METHOD

This study employs the bibliometric analysis strategy, a quantitative technique for analysing academic literature on a particular topic (Sofyan et al., 2022). It gives a thorough picture of research trends, significant publications, authors, and the evolution of the topic over time (Perdima et al., 2022) . By enabling the identification of trends, co-authorship networks, and research hotspots, it provides an invaluable perspective on academic research and management strategies (Sofyan, 2022) for maximising the potential of badminton athletes.

The information needed for this bibliometric study was gathered on December 12, 2023. This particular date guarantees that the study includes the most recent and up-to-date articles, giving a true picture of the trends and advancements in the field's research as of now. The leading resource for finding pertinent scholarly papers was the Scopus database. One of the most significant and most extensive abstract and citation databases of peer-reviewed

literature, Scopus covers a broad spectrum of fields, such as physical education, management, and sports science. Because it offers comprehensive coverage and high-quality data, bibliometric analysis may be conducted with ease using it.

VOSviewer, an effective software program for creating and displaying bibliometric networks, was used to analyse the data (van Eck & Wantman, 2010). VOSviewer makes it easier to identify important research topics and trends and analyse networks of citations, co-citations, and co-authorship. This study attempts to use this bibliometric method to give a thorough picture of the research environment, providing insightful information for sports management practitioners and academics.

RESULTS

The bibliometric analysis from the Scopus database retrieved 589 pertinent publications, including articles, reviews, and conference papers about management strategies for maximizing athlete potential in badminton. On December 12, 2023, the data-gathering procedure was carried out to ensure that the most current and pertinent research in the area was included.

Trends in Publications

The examination of publishing patterns over time indicates a consistent rise in research on this subject. Interestingly, there has been a notable increase in publications over the past five years, suggesting a rising interest in badminton player potential optimization through efficient management techniques. This increased trend indicates how scientific methods of athlete management are becoming more widely acknowledged as critical to improving performance.

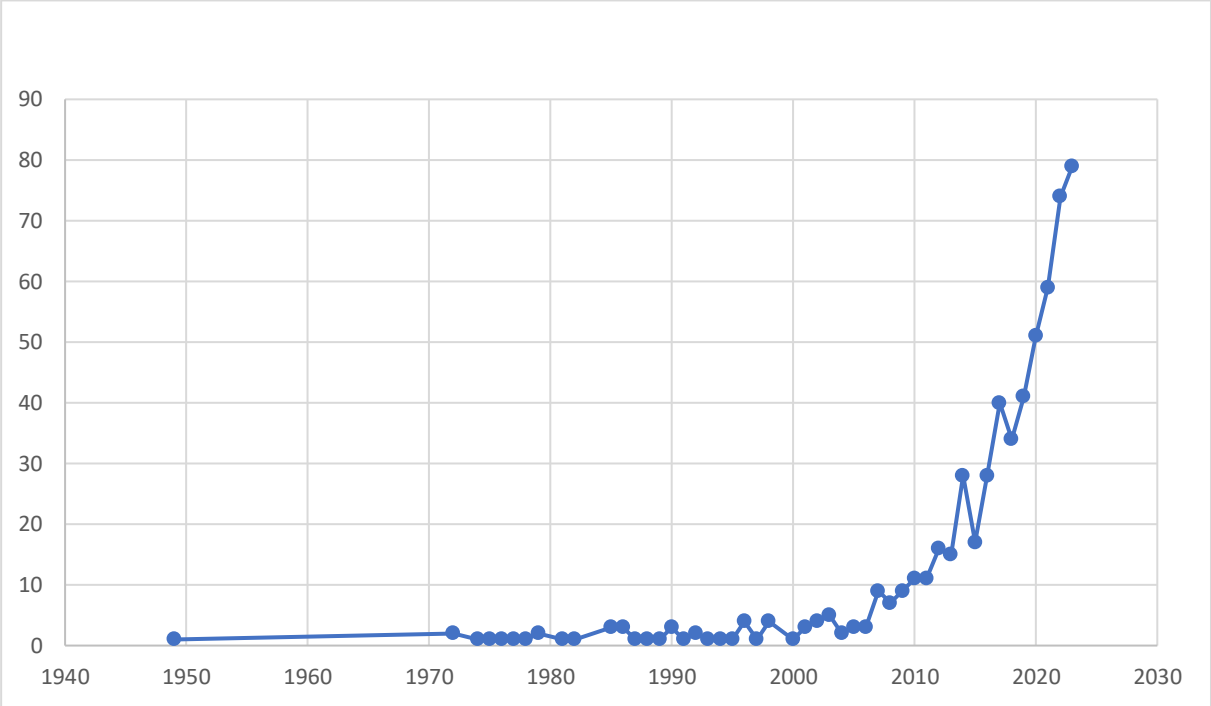

Figure 1. Publication trends

Prominent Authors and Journals

The leading periodicals that publish studies on this subject are as follows:

Table 1. Most Journal and Authors

Source title		Authors	
British Journal Of Sports Medicine	15	Hülsdünker, T.	9
Journal Of Sports Sciences	14	Mierau, A.	9
International Journal Of Environmental Research And Public Health	13	Ribeiro, S.L.G.	7
Revista Brasileira De Medicina Do Esporte	13	Del Coso, J.	6
International Journal Of Sports Physiology And Performance	12	Lam, W.K.	6
Journal Of Physical Education And Sport	11	Rossi, F.E.	6
Plos One	11	Abián, P.	5
International Journal Of Human Movement And Sports Sciences	9	Abián-Vicén, J.	5
Journal Of Strength And Conditioning Research	9	Cabello-Manrique, D.	5
Perceptual And Motor Skills	9	Gu, Y.	5

These publications are well-known for their high impact and stringent peer review procedures, which have significantly advanced our understanding of athlete optimization and sports management.

Table 2. Top cites

Cites	Authors	Title	Year
389	A. Junge, L. Engebretsen, M.L. Mountjoy, J.M. Alonso, P.A.F.H. RenstrÃ¶m, M.J. Aubry, J. Dvorak	Sports injuries during the Summer Olympic Games 2008	2009
193	B. Abernethy, K. Zawi	Pickup of essential kinematics underpins expert perception of movement patterns	2007
191	A. MÃ¶ller, M. Ã…strÃ¶m, N.E. Westlin	Increasing incidence of Achilles tendon rupture	1996
165	N.J. Bureau, E. Cardinal, R. Hobden, B. Aubin	Posterior ankle impingement syndrome: MR imaging findings in seven patients	2000
132	H.H. Thyssen, L. Clevin, S. Olesen, G. Lose	Urinary incontinence in elite female athletes and dancers	2002
123	P. NordstrÃ¶m, U. Pettersson, R. Lorentzon	Type of physical activity, muscle strength, and pubertal stage as determinants of bone mineral density and bone area in adolescent boys	1998
107	O. Faude, T. Meyer, F. Rosenberger, M. Fries, G. Huber, W. Kindermann	Physiological characteristics of badminton match play	2007
102	Y.P.C. Lo, Y.C.S. Hsu, K.M. Chan	Epidemiology of shoulder impingement in upper arm sports events	1990
98	J. Han, G. Waddington, J. Anson, R. Adams	Level of competitive success achieved by elite athletes and multi-joint proprioceptive ability	2015
93	M.J. Wright, D.T. Bishop, R.C. Jackson, B. Abernethy	Functional MRI reveals expert-novice differences during sport-related anticipation	2010

Keyword

The keyword co-occurrence network analysis using VOSviewer identified vital research themes and trends, including significant clusters of keywords, as in Figure 2.

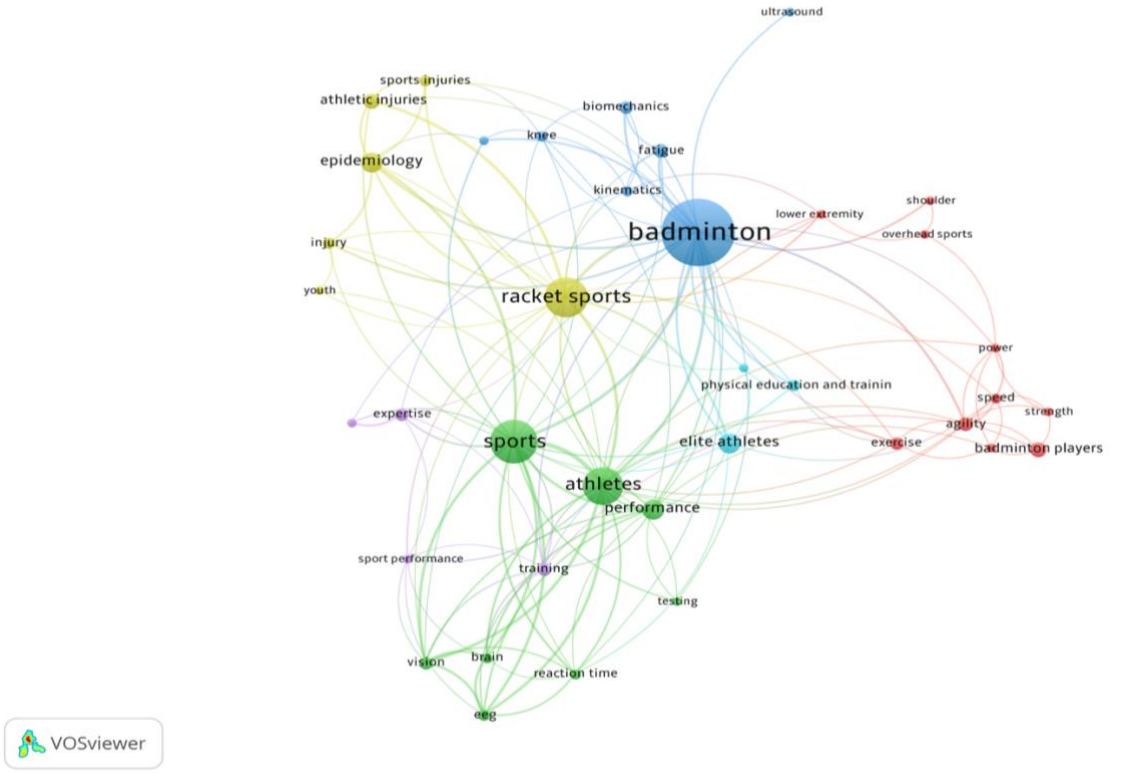

Figure 2. Authors Keywords'

The bibliometric study summarizes the research on management strategies for maximizing badminton player potential. Key findings consist of 1) a notable rise in research output during the previous ten years, 2) Locating famous publications and significant writers in the area, and 3) finding the most frequently used terms in the field. Researchers, coaches, and sports managers looking to improve badminton athlete performance through evidence-based management techniques might benefit significantly from these findings.

DISCUSSION

The number of publications has steadily increased over the past ten years, especially in the last five years. This highlights the rising understanding of the significance of maximizing athlete potential through efficient management techniques. This pattern reflects the more significant shift in sports science towards evidence-based methods and the requirement for rigorous science to improve sports performance. The increase in research production also demonstrates how sports management is becoming more specialized and sophisticated as scholars work to solve the various issues that badminton players confront. As academics work to solve the many issues players encounter, sports management, specifically badminton management, has grown more specialized and sophisticated. Technological developments, data analysis, and the growing understanding of sports' significance in contemporary culture are the main forces behind this progression. Sports analytics is

one field where specialization has been apparent in applying artificial intelligence and computer vision technology. For example, research has looked into using deep learning models to predict player strategies in badminton matches (Wang, 2022).

This breakthrough might improve the game's overall quality and allow for more accurate forecasts, which has important ramifications for the badminton and research communities. Specialization has proven essential in the creation of sports robots. With an 89% success rate, researchers have created and constructed robots that can serve shuttlecocks on a typical badminton court (Chia et al., 2016). This invention shows how automation may be used in sports but also emphasizes the need for more advanced management techniques to successfully incorporate new technology into the game. Another area where specialization has been crucial is with young badminton players and the value of functional training. Studies have shown how important it is to monitor players' physical fitness levels to prevent injuries and maximize performance, as well as how important it is to develop customized training plans based on the unique demands of the activity (Zheng, 2019).

Additionally, the emergence of extensive data analysis has greatly affected sports management. Scholars have employed data-driven methodologies to refine sports product network marketing tactics, augmenting promotional endeavors' comprehensive efficacy and efficiency (Hua, 2020). Finally, advancing action detection technology might completely change how badminton courts are run. These devices provide more efficient monitoring and risk reduction by recognizing various actions, such as walking across the court, playing badminton, or sitting (Chen, 2024). As researchers try to solve players' difficulties, sports administration—especially badminton management—has evolved into a more specialized and complex field. Technological developments, data analysis, and the growing understanding of sports' significance in contemporary culture are the main forces behind this progression.

Leading journals and writers may be identified to give a clear picture of where the most influential research is being published and who is advancing the subject. Publications like the British Journal of Sports Medicine and Journal of Sports Sciences have made a name for themselves as the premier venues for sharing top-notch studies on athlete management. The notoriety of authors such as Hülsdünker, T. and Mierau, A., serves as additional evidence of the contributions of influential thinkers whose work has influenced present procedures and guided future avenues for research.

According to co-occurrence analysis, a wide range of subjects is currently being studied, such as badminton, racket sports, sports, and athletes. The variety of study topics reflects the complex nature of managing athletes, which calls for an all-encompassing strategy that takes into account the psychological, technical, physical, and recuperation components. The frequency of terms associated with injury prevention and psychology indicates that these fields are becoming more widely acknowledged as essential to optimizing sports performance.

This bibliometric analysis's conclusions have several applications for researchers, sports managers, and coaches. Adopting evidence-based practices that improve athlete performance may be made more accessible for practitioners by thoroughly understanding the most significant studies and developing trends. The focus on holistic methods, which include psychological and healing techniques, implies that thorough management procedures are necessary to maximize the potential of athletes. In addition, the designation of pivotal networks for cooperation presents chances for

scholars to participate in transnational and multidisciplinary alliances, promoting further creativity and progress within the domain.

CONCLUSION

This bibliometric study thoroughly summarizes the research on management strategies for maximizing badminton player potential. The results show how the subject is defined by foundational studies, essential contributions, collaborative networks, growing interest in research, and new trends. This study gives important insights for academics and practitioners looking to improve badminton athlete performance via practical management tactics by providing a thorough overview of the current state of research. Subsequent investigations ought to persist in probing inventive and customized methodologies, harnessing technology and multidisciplinary cooperation to propel the domain ahead and bolster the growth of elite athletes.

AKCNKOWLWDGEMENT

We would like to thank all parties who have helped complete this paper.

CONFLICT OF INTEREST

There are no conflicts of interest in this article.

REFERENCES

Ariani, L. P. T. A., Sudiana, I. K., & Kusuma, K. C. A. (2022). Continuous and competitive circuit training: Methods to increase vo2max on young badminton player. *Journal Sport Area*, *7*(2), 236–245. https://doi.org/10.25299/sportarea.2022.vol7(2).9423

Chen, Y. (2024). Action Detection in Badminton Courts Using AVA Dataset and MMAction2 Architecture with Slow Fast Model. *Highlights in Science, Engineering and Technology*, *85*, 783-789. https://doi.org/10.54097/qrh46274

Chia, K. S., Yap, X. Y., & Low, E. S. (2016). A badminton robot-serving operation design. *ARPN J. Eng. Appl. Sci*, *11*(6), 3968-3974.

Gallardo, M. P. C., Pradas de la Fuente, F., Moreno-Azze, A., & Carrasco Páez, L. (2023). Physiological demands of racket sports: a systematic review. *Frontiers in Psychology*, *14*. https://doi.org/10.3389/fpsyg.2023.1149295

Hua, H. (2020, February). Improvement Strategy of Sports Product Network Marketing Strategy Based on Big Data Analysis. In *2020 12th International Conference on Measuring Technology and Mechatronics Automation (ICMTMA)* (pp. 885-889). IEEE. https://doi.org/10.1109/ICMTMA50254.2020.00191

Panda, M., Rizvi, M. R., Sharma, A., Sethi, P., Ahmad, I., & Kumari, S. (2022). Effect of electromyostimulation and plyometrics training on sports-specific parameters in badminton players. *Sports Medicine and Health Science*, *4*(4), 280–286. https://doi.org/10.1016/j.smhs.2022.08.002

Perdima, F. E., Kristiawan, M., Sofyan, D., & Abdullah, N. M. (2022). Literature of the management of physical education based on the Scopus database: A bibliometric

review. *Journal Sport Area*, *7*(3), 473-482. https://doi.org/10.25299/sportarea.2022.vol7(3).10734

Ranaweera, J., Zanin, M., Weaving, D., Withanage, C., & Roe, G. (2021). Optimizing player management processes in sports: translating lessons from healthcare process improvements to sports. *International Journal of Computer Science in Sport*, *20*(2), 119-146. https://doi.org/10.2478/ijcss-2021-0008

Rudnichenko, Y. M., Havlovska, N. I., Matiukh, S. A., Lopatovskyi, V. H., & Yadukha, S. Y. (2019). Optimization of the interaction of industrial enterprises and foreign counterparties using pure player strategies in a non-cooperative game. *TEM Journal*, *8*(1), 182. https://doi.org/10.18421/TEM81-

Sofyan, D. . (2022). The Development of Sports Management Research in Indonesia in the Early Twenty-First Century: A Bibliometric Analysis. *Indonesian Journal of Sport Management*, *2*(1), 28–37. https://doi.org/10.31949/ijsm.v2i1.2248

Sofyan, D., Saputra, Y. M., Nurihsan, J., Kusmaedi, N., & Abdullah, K. H. (2022). Stance of Sports and Fitness: A Scientometric Review. *Physical Education Theory and Methodology*, *22*(4), 596–607. https://doi.org/10.17309/tmfv.2022.4.20

van Eck, N., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*, *84*(2), 523-538. https://doi.org/10.1007/s11192-009-0146-3

Wang, W. Y. (2022, October). Modeling turn-based sequences for player tactic applications in badminton matches. In *Proceedings of the 31st ACM International Conference on Information & Knowledge Management* (pp. 5128-5131). https://doi.org/10.1145/3511808.3557820

Zhang, L. (2023). Physical Strength Training Methods in Badminton Teaching and Training. *Revista Brasileira de Medicina Do Esporte*, *29*. https://doi.org/10.1590/1517-8692202329012022_0253

Zheng, J. (2019). Research Progress and Trend of Functional Physical Training for Young Badminton Players. *China: Southwest Petroleum University*. https://doi.org/10.25236/mfssr.2019.173