

## Exploring the evolution of physical education and school health research: A bibliometric analysis

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### ABSTRACT

Physical education and school health have received more attention in recent years due to the growing concern over sedentary lifestyles and the rising prevalence of obesity and other health problems among children and adolescents. As a result, there has been an increase in the study on this topic, making it crucial to assess publishing trends and identifying critical areas of concentration. This study aimed to map the school physical education and health literature between 2013 and 2022. VOSviewer was used to analyse 1,427 article documents. This study indicated that 2019 was the peak year for publications, with 183 documents. This result signifies increased interest and investment in this field's study. This publication's rise implies that researchers, institutions, and funding agencies prioritise physical education and school health research to encourage healthy lifestyles and prevent chronic diseases in children and adolescents. The subject area "Medicine" was the most focused on physical education and school health studies, with 1,229 documents. The BMC Public Health journal published the most articles, with 165 documents. Lubans, D.R., from the University of Newcastle, Australia, was the most prolific author with 32 documents. The keyword "physical activity" was the most used in cluster 1, with 450 occurrences and a total link strength of 678. This study results guide the most recent references in physical education and school health to guide future research appropriately. Future research may investigate using technology and digital media to encourage physical activity and healthy lives. In addition, future research may identify methods for incorporating school health and physical education programmes.

**Keywords:** Physical education; school health; bibliometric; VOSviewer

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## INTRODUCTION

Research in physical education and school health has exploded recently, emphasising encouraging healthy lifestyles and preventing chronic diseases in children and adolescents. Academics argue that behaviour change strategies are used in physical and health education, and several behaviour modification programs have become known for their innovative work in schools (Thomson & Robertson, 2014). There is a need to clarify "what" students are expected to learn in physical education, with particular emphasis on learning how to move or learning how to move while understanding that

potential is a necessary component of moving (Nyberg & Larsson, 2014). Sports and physical education are now ingrained in the lifestyles of people around the world. Lifestyle Sport Activities (LSA) is an element of contemporary sports culture and has a place in modern society (Gilchrist & Wheaton, 2017; Janeckova et al., 2021). The physical education they receive at school significantly impacts how committed or interested young people are in physical activity or sports (Griggs & Fleet, 2021). Every level of education, from elementary school to high school, includes sports and physical education as compulsory subjects in the curriculum. This shows that physical education and sports are analogous to other subjects and should not be ignored or underestimated (Sofyan et al., 2022a).

Schools are great places for treatment that helps children learn and develop techniques to overcome obstacles in life while maintaining high levels of physical and psychological wellbeing (Cronin et al., 2020; Pechmann et al., 2020; Piñeiro-Cossio et al., 2021). This reflected that school health is a fundamental approach that can be used to improve health and education outcomes that indirectly depicted the vital of a cross-disciplinary research topic (Kolbe, 2019). Sports and physical activity for young people's social and personal growth and development have been the focus of increasing research in recent years. According to research, physical education and school sports offer a suitable and efficient framework for teaching and transferring skills and tactics to reduce risky behaviour and increase wellbeing (Méndez & Ruiz-Esteban, 2019; Opstoel et al., 2020). Physical and health education provides students the information and skills to understand their bodies while maintaining their health (Petherick, 2018).

Even though this content has been used to instill good living habits since elementary school, there are still many students who do not practise it regularly. School health instruction focuses on healthy lifestyles and reproductive health. Several studies have investigated the factors that contribute to this phenomenon, including: 1) Poor socioeconomic status can lead to a lack of access to health services and unbalanced eating behaviour, which can have a negative impact on children's health and nutrition (Buonomo et al., 2020); 2) Adolescents may have poor postural quality due to a sedentary lifestyle and low self-awareness of body alignment and movement quality (Jankowicz-Szymańska et al., 2022); and 3) The habit of eating breakfast is a significant risk factor for anaemia in elementary school children (Sirait et al., 2020). Most junior and senior high school students have completed puberty or are adults, so they must understand why maintaining reproductive health is essential (Diarsvitri & Utomo, 2022). School health instruction focuses on healthy lifestyles and reproductive health, including physical education (PE), staff professional development, healthy school policies, active recess, family and community involvement, healthy eating, and physical activity in the classroom (Bailey et al., 2021). Communication about sexual and reproductive health (SRH) issues between parents and adolescents is very important to promote healthy sexual practises and reduce risky behaviour (Bikila et al., 2021). Trends in teaching SRH skills in secondary schools show limited change and decline (Szucs et al., 2023; Young et al., 2022).

The importance of a healthy lifestyle for students is highlighted above deviant lifestyles such as drug use and smoking. The importance of a healthy lifestyle for students is highlighted above deviant lifestyles such as drug use and smoking. Here are some reasons why a healthy lifestyle is important for students, namely to maintain physical health, mental well-being, academic achievement, disease prevention, and social and emotional development (Denysovets & Kvak, 2020), and all of this can be achieved through physical education classes, conversations with teachers, and the use of multimedia resources to provide information and motivation (Silchuk et al., 2020).

Teaching physical education and health topics is not the only way schools can influence students' behaviour to lead healthy lives. It can also teach self-management skills (Budiman et al., 2017), explore the role of physical education in promoting values such as respect, community, cooperation, fun, health, and fair play (Soto, 2020), and incorporate skills into the physical education curriculum (Vidoni, 2016). In addition, students medical center was established to help students develop their life skills in class, so students' medical center should be used in schools.

While there is a wealth of research on physical education and school health, there is a paucity of comprehensive bibliometric analyses examining the evolution of research in these areas. Therefore, there is a paucity of understanding of the overall trajectory and development of physical education and school health research. This bibliometric study which maps research topics and allows a more comprehensive selection, is an impartial and reliable resource (Hernández-Torrano et al., 2020). This is due to researchers and librarians are at the forefront of creating innovation and providing policymakers with ideas (Nurhasan et al., 2022). The main focus of this research covers the broader aspects of physical education or health promotion. This research provides a deeper understanding of the efforts that schools make to improve the health of their members. By identifying research trends and efforts to improve physical education and school health, this research can guide policymakers and schools in developing innovative formulas and more effective strategies for physical education and health promotion. This research has the potential to inform policy decisions and educational reforms, leading to improved physical education curricula, better school health policies, and ultimately healthier and more active student populations.

In this bibliometric review, the authors are particularly interested in research topics related to physical education and school health. Furthermore, we would like to reveal some of the parameters in the bibliometric analysis by formulating the following questions:

1. Formulation of the problem: how is the evolution of publications from time to time?
2. What field of study is the focus of research on physical education and school health?
3. What are the top scientific sources on physical education and school health?
4. Who is the most productive writer in publishing articles related to physical education and school health?
5. What are the authors most frequently used keywords?

## **METHOD**

Bibliometric research is a statistical method for publishing scientific papers with various types of documents, including articles, books, book chapters, reviews, and so on, recognised globally. Building a system to analyse research in the literature and find publication patterns and trends is proven reliable by bibliometric analysis (Abdullah & Sofyan, 2022). An essential initial step in this bibliometric assessment is identifying and determining the research objectives (Sofyan et al., 2022b).

The first step is to select a database as an object to retrieve its metadata. This metadata will later provide information related to various distribution parameters, for example, year, country, affiliation, author, and keywords. The bibliometric analysis begins by identifying keywords that will lead to accurate information relating to the research question (Abdullah, 2021a). The Scopus database was chosen as the research object because it is one of the most significant abstract collections in the world and has a high impact factor. The Scopus database was chosen because it includes more documents than Web of Science and PubMed and is commonly cited in previous research (Khiste & Paithankar, 2017; Sweileh et al., 2018). This evaluation used data

exported to Microsoft Excel in Comma-separated Values (CSV) and Research Information Systems (RIS) formats (Abdullah, 2021b).

The second step is to retrieve the metadata. Data was collected on December 31, 2022, using the keyword search string TITLE-ABS-KEY (“physical education” OR “physical activity\*” OR “sport\* education”) AND (“school health”)) AND (LIMIT -TO (PUBYEAR, 2022) OR LIMIT-TO (PUBYEAR, 2021) OR LIMIT-TO (PUBYEAR, 2020) OR LIMIT-TO (PUBYEAR, 2019) OR LIMIT-TO (PUBYEAR, 2018) OR LIMIT-TO (PUBYEAR, 2018) 2017) OR LIMIT-TO (PUBYEAR, 2016) OR LIMIT-TO (PUBYEAR, 2015) OR LIMIT-TO (PUBYEAR, 2014) OR LIMIT-TO (PUBYEAR, 2013)) AND (LIMIT-TO (PUBSTAGE, “final”)) AND (LIMIT-TO (DOCTYPE, “ar”)) AND (LIMIT-TO (LANGUAGE, “English”)) AND (LIMIT-TO (SRCTYPE, “j”)). A total of 1,427 documents were found in the last 10 years (2013-2022). The minimum and maximum standards of learnable metadata and the number of metadata numbers for bibliometric analysis are not stated (Sofyan, 2022). The third step is conducting data analysis using special software for mapping. VOSviewer is used in this research, and then carry out a descriptive analysis based on various parameters determined in the problem formulation.

**RESULTS AND DISCUSSION**

The growth and development of publications related to physical education and sports health have spurred writers to continue publishing quality academic papers. The publication growth from year to year experienced a fluctuating graph. Based on searching and collecting data on the Scopus database for the last ten years, a total of 1,427 documents were obtained. We can see that 2019 was the year when the publication rate was the highest between 2013-2022, with 183 documents published in various reputable journals and indexed by the Scopus database. Whereas 2022 will be the year with the lowest number of publications, namely 113 documents that have been published. The number of other documents for the last ten years was 129 documents in 2021, 2020 (130), 2018 (146), 2017 (139), 2016 (132), 2015 (144), 2014 (158), and 2013 (153) documents.

Of all the existing documents, the subject area “Medicine” is the most focused on studying physical education and school health in various objects, including children, youth, and universities, with a total of 1,229 documents that have been published. Table 1 describes the other 20 subject areas related to physical education and school health.

**Table 1. Research Areas Related to Physical Education and School Health**

Field of study	Total Documents	Field of study	Total Documents
Medicine	1.229	Neuroscience	26
Social Sciences	273	Business, Management, and Accounting	16
Nursing	221	Pharmacology, Toxicology, and Pharmaceutics	6
Arts and Humanities	143	Energy	3
Health Professions	130	Engineering	3
Environmental Science	91	Immunology and Microbiology	3
Psychology	66	Computer Science	2
Agricultural and Biological Sciences	56	Dentistry	2
Biochemistry, Genetics and Molecular Biology	44	Economics, Econometrics, and Finance	2
Multidisciplinary	41	Mathematics	2

### The most well-known Scopus-indexed journal

Reputable journals are now becoming the new idol as a destination that can accept and publish articles that have been made. The authors sometimes do not care whether the journal is paid or not. To be sure, the writers flocked to be able to look for it. “BMC Public Health” journal has the most published articles with 165 documents, followed by “The Journal of School Health” with 126 documents. Table 3 shows ten reputable and Scopus-indexed journals, the main choices and objectives in publishing articles related to physical education and school health.

**Table 2. The Most Prominent Journals in Publishing Related to Physical Education and School Health**

Source Title	Total Documents	Rating on Scimago	SJR
BMC Public Health	165	Q1	1.16
Journal of School Health	126	Q1	0.69
International Journal of Environmental Research and Public Health	84	Q1	0.81
Preventive Medicine	44	Q1	1.41
Plos One	41	Q1	0.85
International Journal of Behaviour Nutrition and Physical Activity	33	Q1	2.03
Nutrients	29	Q1	1.29
BMJ Open	26	Q1	0.89
Journal of Physical Activity and Health	25	Q2	0.77
Health Promotion Practice	21	Q2	0.5

### Authors

Researchers are driven to produce and publish their findings in well-known journals due to the improved accessibility of information made possible by scientific developments. In addition to fulfilling their responsibilities as instructors, presenters, practitioners, and researchers, this demonstrates their dedication to their particular fields. Table 2 describes the eight most productive authors in creating works related to physical education and school health, with a minimum of 14 documents.

**Table 3. The Most Prolific Authors of Physical Education and School Health Publications**

Authors	Affiliate	Total Documents	All Situations	The entire H-Index	All 10 H-Indexes
Lubans, D.R.	University of Newcastle	32	28604	85	261
Morgan, P.J.	University of Newcastle	21	27217	86	261
Wolfenden, L.	University of Newcastle	18	15126	59	253
Okely, A.D.	University of Wollongong	16	29755	86	253
Jago, R.	University of Bristol	14	21237	76	226
Nathan, N.	Hunter New England Population Health	14	4013	34	69
Pate, R.R.	University of South Carolina	14	125518	136	471
Sutherland, R.	University of Newcastle	14	3649	34	70

### Keywords

The use of keywords is vital for writers to inform readers that the overall content of the manuscript can be represented by the keywords used. Based on the output of VOSviewer, three clusters of 2,233 keywords were obtained with a minimum number of occurrences of 30 times, so the 22 keywords most commonly used by writers were obtained. Cluster 1 is shown with a red stain, Cluster 2 is shown with a green stain, and

Cluster 3 is shown with a blue stain (Figure 1). The keyword “physical activity” is the most used keyword in cluster 1, with a total of 450 occurrences and a total link strength of 678. In cluster 2, the keyword “adolescents” is the most used keyword, with a total of 190 occurrences and a total link strength of as many as 277. Whereas in cluster 3, the keyword “obesity” is the most used, with a total of 163 occurrences and 291 total link strengths.

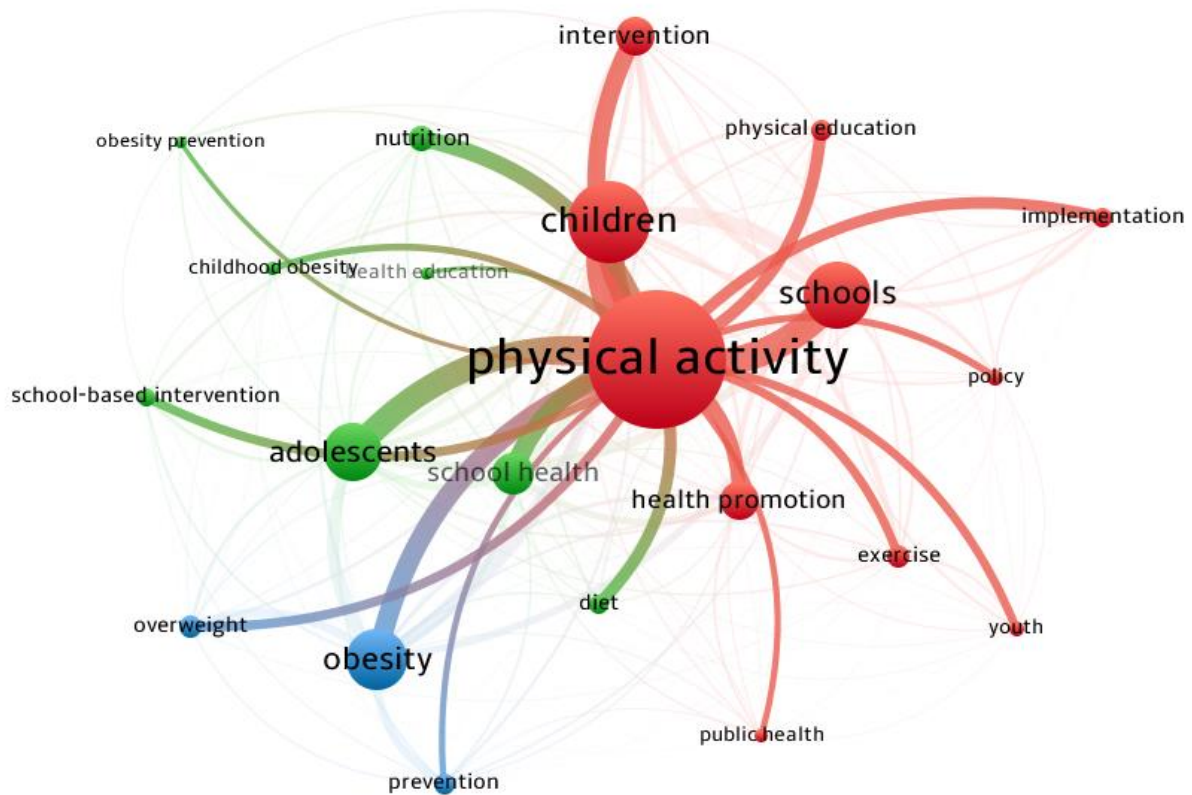


Figure 1. Cluster 1 Red Stain, Clusters of 2 Green Spots, Clusters of 3 Blue Spots

Schools are the perfect place to teach children about health and provide students with opportunities to practice new health-related behaviours and skills. A positive school climate positively influences teachers’ self-efficacy, their health, and the effectiveness of student learning (Ferdianto, 2019). The main learning areas of Health and Physical Education (HPE) provide opportunities for students to develop health literacy, including menstrual health literacy (Curry et al., 2023). Improving students’ health became a national priority when public education was instituted in the early 20th century to provide a healthy and capable workforce (Kelder et al., 2014). In addition, it has also been suggested that physical education teachers should be positioned as physical activity leaders who can organise and facilitate physical activity opportunities throughout the school day (Erwin et al., 2013). Therefore, schools need to be supported to develop health education policies and tools where a real, inclusive, and shared culture can occur among all staff, including non-teaching staff (FitzPatrick, 2019). By involving schools as key partners in health education, we can create a supportive environment for children to grow and develop healthily. In this case, the role of schools is very important in forming a generation that is aware of the importance of health and is able to implement healthy behaviour in their daily lives.

Based on the research results, it can be revealed that 2019 was the year when the publication rate was the highest between 2013-2022, with 183 documents. This

happened because before the Covid-19 pandemic started to hit at the end of 2019, writers, practitioners, teachers, lecturers, and physical and health education activists could still conduct field research, so this year, many papers were produced and indexed by Scopus. However, it decreased in the following year, namely from 2020 to 2022. This may result from the Covid-19 pandemic, limiting activity and movement. Such affects the writers' productivity when writing scholarly material for publication.

Furthermore, the subject area of physical education and school health publications is the subject of "Medicine", with 1,229 documents. The research appears to focus more on physiological elements of health, such as 1) nutritional needs, 2) the impact of physical activity, and 3) exercise interventions. At the same time, the most prevalent scientific source is "BMC Public Health", with 165 documents. This aligns with the subject area, which focuses on health. Thus, leading scientific sources, "BMC Public Health", with high standards and high qualities, are the first choice for publishing their academic papers. This information can be helpful for researchers and stakeholders in the field to guide their publication choices and future research directions.

David Revalds Lubans of the University of Newcastle, Australia, is the most prolific author in physical education and school health research. This discovery contributes significantly to our knowledge of the academics driving developments in this field. In addition, his work, "Fundamental Movement Skills in Children and Adolescents Review of Associated Health Benefits", which has received 1626 citations, demonstrates the significance of mastering fundamental movement skills in fostering children's physical, cognitive, and social development. This study emphasises the crucial role that physical education and school health programmes can play in promoting healthy lifestyles and reducing chronic diseases among children and adolescents. The work of Lubans and other renowned scholars in the field can influence future study and programme development in this area.

The result that "physical activity" was the most commonly used keyword in physical education and school health research has significant ramifications for the creation of future research and programmes on this subject. We The researchers assume that physical activity is crucial in improving and developing motor skills, health status, cognitive abilities, and social skills. This result is corroborated by [Bailey et al. \(2021\)](#), who stated that physical education fosters respect in children for their bodies and those of others, aids the integration of mind and body, fosters an understanding of the health benefits of aerobic and anaerobic exercise, positively enhances self-confidence and self-esteem, and improves social, cognitive, and academic achievement. By identifying the most frequently used keywords by authors, this study provides significant insight into the issues and themes currently driving research and innovation in this field. In particular, the dominance of "physical activity" as a keyword highlights the importance of exercise and movement in boosting health and preventing chronic diseases. This information can be used to inform the design of future research studies and programme interventions aimed at boosting the physical activity levels of children and adolescents. This research can ultimately improve the health and wellbeing of individuals, families, and communities by emphasising the significance of physical activity and its involvement in illness prevention.

## **CONCLUSION**

This study aims to map physical education and school health publications published between 2013 and 2022. The VOSviewer software was then used to assess 1,427 article documents found in the Scopus database to obtain the data needed for analysis. The analysis findings show that there have been fluctuations in physical education and

sports health publications, especially between 2020 and 2022, which have decreased in the last 10 years of publication. The study also identified key authors, journals, subject areas driving advancements in this field, and the most popular keywords used in research studies. The primary contribution of this research lies in its systematic analysis of the evolution of physical education and school health research. By conducting a bibliometric analysis, the study contributes to the body of knowledge by offering a comprehensive understanding of the research landscape, including the growth of research output over time, the most influential authors and publications, key research themes and topics, and potential research gaps. This information can guide future research efforts, facilitate collaboration among researchers, and aid in the development of evidence-based interventions and policies to promote physical education and school health.

This study is limited by its reliance on the Scopus database, which may not capture all relevant physical education and school health papers. Scopus is one of the largest available bibliographic databases; however, it may not contain all appropriate physical education and school health papers. Some researchers may publish their work in databases or periodicals not covered by Scopus. Hence, it is probable that our investigation missed some significant publications. Despite its limitations, this study provides valuable insights into the current level of physical education and school health research. This study can influence future research investigations and programme initiatives to enhance children's and adolescents' health and wellbeing by identifying influential authors, journals, subject areas, and keywords. Researchers and practitioners can utilise this material to guide their research and practice and expand upon the existing body of literature in the field. The study findings can inform policies and initiatives designed to promote physical activity, good eating, and other behaviours contribute to better health outcomes for children and adolescents. Future research in physical education and school health could expand upon this bibliometric study by incorporating various databases and conducting more detailed analyses. Future research could also investigate developing trends in the sector, such as using technology and digital media to promote physical exercise and healthy lives. Future research could uncover ways to implement physical education and school health programmes in various.

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#### **CONFLICT OF INTEREST**

The authors state no conflict of interest.

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