

An exploration of life skill development through sport: Current status and future directions in a systematic review and bibliometric analysis

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ABSTRACT

The development of life skills through sports has become a focus in the Positive Youth Development (PYD) program, emphasizing that sports can serve as a tool to build transferable life skills. This research explored the development of cognitive, social, and emotional skills through sports participation, particularly examining the effectiveness of structured programs for socially vulnerable youth. Using systematic literature review and bibliometric analysis methods, 1,000 articles were initially screened for bibliometric analysis and refined to 21 articles for systematic literature review. Results showed that sports-based interventions effectively facilitate life skills development such as leadership, emotional control, and self-management, especially when programs include clear skill transfer objectives. The study emphasizes the importance of participants' awareness and deliberate teaching for effective skill transfer beyond sports contexts. The expected outcomes include developing life skills that benefit students' daily lives, enabling them to maintain positive relationships and address challenges effectively through sports activities.

KEYWORDS

Coach Training; Education; Life Skills; Youth; Youth Coaches

1. INTRODUCTION

Positive Youth Development (PYD) is an approach to youth work based on the belief that all young people have strengths and skills that can be developed if aligned with the right resources (Holt et al., 2017a). PYD is considered most effective when young people have positive relationships with peers, adults, and institutions in their lives (Turnnidge et al., 2014). The PYD program views young people as unique individuals and acknowledges that developmental challenges impact young people in different ways (Bruner et al., 2023). However, the PYD program avoids framing developmental issues as problems to be solved (Newman & Anderson-Butcher, 2021). PYD identifies a series of developmental assets including (1) physical development, (2) intellectual development, (3) emotional development, and (4) social development (Khanna, 2021).

Sports-based development programs intentionally use the context of sports and physical activities as a means to achieve PYD outcomes (Tomé et al., 2021). These programs provide structured sports and physical activity experiences to young people that explicitly prioritize the development of personal and social life skills (Qi et al., 2022), along with physical development that is more often associated with sports participation. In this context, life skills are broadly defined as personal assets that enable young people to survive and thrive in various areas of their lives (Abdul Kadir et al., 2021). However, although sports skills encompass physical and technical movements specific to the content of the sport (for example, dribbling a basketball or serving a tennis ball), life skills can be generalized or transferred to non-sport contexts (Waid & Uhrich, 2020).

In this article, examples of life skills include leadership, self-control, respect, and self-direction. Many experts have attempted to define the concept of life skills transfer in the literature. For example, Fizi et al. (2023a) defines transfer as the application of lessons learned in the gym to school, home, and community life. This field of research often relies on self-reports from students or observations by teachers/trainers about behavior as a method to measure whether transfer has occurred placing a strong emphasis on learning outcomes rather than the processes students undertake to achieve them (Fizi et al., 2023a). Gould and Carson approached this idea differently: referring to the term "transferability" of life skills, which is "the belief that the skills and qualities acquired (from sports programs) are valued elsewhere," along with students who have "confidence in their ability to apply skills in different environments." This definition introduces the cognitive element of students where they must find relevant material and be confident in using it (Wium & Dimitrova, 2019). Overall, there is a clear reason in the literature to examine the role of youth cognitive processes in the transfer of understanding (Ciocanel et al., 2017).

Life skills encompass a broad array of intrapersonal and interpersonal assets, characteristics, and competencies such as leadership, self-control, respect, self-direction, goal setting, emotional regulation, self-esteem, time management, social skills, verbal and nonverbal communication, teamwork, and a strong work ethic that empower young people to navigate and succeed across diverse contexts, from personal challenges to social interactions (Newman et al., 2023a; Prajapati & Sharma, 2017a). Central to their value is the concept of transfer, or transferability, which refers to the deliberate facilitation, learning, and application of these skills from one setting to another, such as adapting conflict resolution and peer collaboration honed in youth sports to foster healthier relationships at school, home, or in the community; this process hinges not only on observable behavioral outcomes, often gauged through self-reports or trainer observations, but also on the cognitive dimension of recognizing relevant skills and cultivating confidence in their deployment amid risk factors like poverty or adversity (Pierce et al., 2017; Prajapati & Sharma, 2017b). In positive youth development (PYD) frameworks, particularly sport-based programs designed for socially vulnerable youth, life skills transfer embodies a resilience building mechanism that mitigates risks while amplifying protective factors, transforming structured activities like organized play into multidimensional platforms for holistic growth and adaptive thriving (Hodge et al., 2013a, 2013b).

Additionally, many studies investigating life skills use easily accessible samples in interscholastic sports. Even in community-based sports PYD programs, questions arise regarding the effectiveness of these programs for socially vulnerable and at-risk youth. In a recent systematic review of sports-based PYD programs, Whitley questioned the impact of these programs among different populations of young people, particularly because "social inequalities and environmental characteristics disproportionately affect the health of low-income youth." Thus, socially vulnerable and at-risk youth, who might benefit the most from sports-based PYD programs, are overlooked (DÜZ & ASLAN, 2020). Furthermore, the perspective of socially vulnerable youth—especially youth of color from economically disadvantaged urban environments—is limited in the general development of youth and also in social work literature. Research is needed that recognizes the outcomes related to the development of life skills and the transfer of life skills as distinct results. There is also a need to build knowledge from the life experiences of young people who are currently experiencing those outcomes. In the end, research is needed to clearly understand the impact of community-based sports PYD among socially vulnerable and at-risk youth, as this population of youth may be most susceptible to developing and/or engaging in behavioral health issues.

The purpose of this research is to critically examine the content, process, and underlying

principles of physical education in relation to the broader concept of physical skills. The authors argue that the discussion on life skills leads to an early narrowing of research focus on "things" that are considered useful, positive, teachable, concrete, and "objective." To address this gap, this paper is structured as follows. First, the researchers explore the "what," "how," and "why" of life skills and then derive the philosophical foundation of the agenda. Second, the researchers explore the concept of existential learning as an alternative to life skills and suggest that this can complement our understanding of physical learning in a significant way.

1.1. Literature Review / Understanding Bibliometric Methodology

Bibliometric methodology is a discipline of quantitative analysis that uses mathematical and statistical methodologies to uncover patterns and trends in scientific production and communication (Hassan & Duarte, 2024). Bibliometrics includes the analysis of various aspects such as the number of publications, citations, author collaborations, and keywords to understand the structure of knowledge and the direction of development in a field (Lyu et al., 2023). Quantitative text analysis uses computational methods that enhance objectivity and reduce bias by relying on statistical and mathematical evaluations of textual data, minimizing manual interpretation (Nielbo et al., 2024). Quantitative bibliometric analysis evaluates literature across various fields, allowing for the identification of trends, influential authors, and key topics, thereby providing specific insights for each field of study (Ellili, 2024) and provides in-depth information analysis, including keywords, journals, countries, references, etc. Bibliometric analysis, enhanced with software like VOSviewer, facilitates graphical representation and visualization of research trends, allowing for reverse interpretation of literature relationships and intellectual structures across various fields (Ullah et al., 2023).

Table 1. Comparison of Bibliometric Analysis, Meta-Analysis, and Systematic Literature Review (Passas, 2024)

Type of Review	Purpose	When to Use	When Not to Use	Scope	Dataset
Bibliometric Analysis	Summarizing a large amount of data to show trends and structure.	Broad review and large dataset	Specific review and manageable small dataset	wide	Big
Meta-analysis	Summarizing empirical evidence and discovering new relationships	Summarizing the results of a homogeneous study	Heterogeneous studies and low-quality studies	Wide or Specific	Big or Enough
Systematic Literature Review	Summarizing and synthesizing existing literature findings	Specific review with a manageable small dataset	Extensive review with a large dataset	Specific	Small

2. METHODS

2.1. Design

This investigation employed a comprehensive mixed-method approach that integrates systematic literature review protocols with bibliometric analysis utilizing quantitative bibliometric indicators and network visualization techniques. The research design follows established bibliometric protocols as outlined by Danvila-del-Valle et al. (2019) combined with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to examine the intellectual structure and thematic evolution of life skill development through sport literature. The methodology incorporates descriptive bibliometric analysis enhanced by bibliometric science mapping techniques to provide both qualitative synthesis and quantitative knowledge structure analysis, ensuring systematic rigor in data collection and analysis procedures while offering comprehensive insights into the field's development patterns and emerging research trends.

2.2. Data Sources and Search Strategy

The primary data source comprises peer-reviewed articles indexed in the Scopus database, selected for its comprehensive coverage of multidisciplinary research and standardized citation metrics. The search strategy employed the PICO (Population, Intervention, Comparison, Outcome) framework to ensure systematic identification of relevant literature. The search string "(TITLE (LIFE SKILL DEVELOPMENT THROUGH SPORT))" was applied with refinement criteria including document type (Article), language (English), and publication period (2015-2025), yielding an initial dataset of 40,379 records. Supplementary searches were conducted across ERIC and Taylor & Francis databases to ensure comprehensive coverage of educational and sport science literature. The temporal scope encompasses a ten-year period (2014-2025) to capture contemporary research trends while maintaining sufficient historical depth for trend analysis. This timeframe aligns with the emergence of evidence-based approaches to positive youth development through sport programming.

2.3. Data Collection and Processing

The initial search yielded 845 records, which underwent systematic screening following PRISMA protocols. Duplicate removal (n=95) and automated filtering based on publication criteria (n=550) resulted in 200 records for abstract screening. Following full-text assessment, 21 articles met the final inclusion criteria for comprehensive analysis. Data extraction utilized Covidence (<https://www.covidence.org/>), a web-based systematic review management tool, ensuring standardized data capture and reviewer agreement assessment. Extracted variables included: author information, publication year, journal details, geographical origin, research methodology, participant

characteristics, and key findings.

2.4. Systematic Literature Review and Bibliometric

This study adopts a bibliometric approach to comprehensively map the landscape of knowledge while identifying thematic developments, collaboration networks, and scholarly influence over time. The choice of a bibliometric method is grounded in recent literature that highlights the value of quantitative analysis and data visualization for evaluating research trajectories and interdisciplinary connections. The integrated literature review underscores the relevance of this approach, demonstrating how publication patterns can be linked to the evolving theoretical context of physical education and character development.

Primary data were retrieved from the Scopus database, chosen for its broad international coverage and standardized metadata. After a rigorous screening of keywords and the application of inclusion and exclusion criteria to ensure data quality, the analysis proceeded through a series of interconnected stages. VOSviewer version 1.6.18 was used to visualize knowledge networks and reveal keyword co-occurrence as well as patterns of collaboration among authors and institutions.

The analytical workflow encompassed performance analysis to track publication growth trends, author productivity, and the prominence of key journals and institutions. Science mapping followed, uncovering scholarly linkages through co-authorship, co-citation, bibliographic coupling, and co-word analysis. Collaboration networks and thematic evolution were further examined through network analysis, while content analysis was employed to categorize themes and identify the conceptual structure underlying the field.

To ensure a comprehensive portrayal of the research domain, the study evaluated a range of bibliometric indicators. Publication metrics included annual output, growth trajectories, geographic distribution, and journal impact factors with quartile rankings. Citation indicators such as total and average citations, authors' and journals' H-index values, and citation network structures were applied to assess scientific influence. Collaboration metrics captured patterns of co-authorship, levels of international cooperation, and cross-disciplinary research clusters, while content indicators analyzed keyword frequency and co-occurrence, thematic evolution, and conceptual structure through co-word analysis. Together, these procedures produced a nuanced knowledge map that not only describes the current state of research but also highlights emerging directions and potential future developments.

Table 2. Research questions

Research Question	Description	Objective	Motivation
RQ1	Who are the leading authors, journals, and institutions in the literature on life skill development through sport, and which articles are the most cited?	To identify the most influential authors, journals, and institutions in the literature	To provide insights into scientific leadership and key sources in life skill development through sport research
RQ2	What are the main topics researched, which countries contribute the most to the scientific output, and what are the most frequently used keywords in the literature on life skill development through sport?	To determine the primary research topics, geographical contributions, and dominant keywords	To understand the current research focus and global trends in life skill development through sport
RQ3	How are the bibliographic map, conceptual, intellectual, and social structures, and the knowledge base of research on life skill development through sport represented?	To conduct an in-depth analysis of the literature's structure and relationships	To provide a comprehensive overview of the research landscape and interconnections among concepts
RQ4	What are the key research works on life skill development through sport based on a Systematic Literature Review, including their methods, applications, and future directions?	To identify major works, methodologies, practical applications, and potential future research directions	To support the scientific community and practitioners in advancing research and practical applications of life skill development through sport

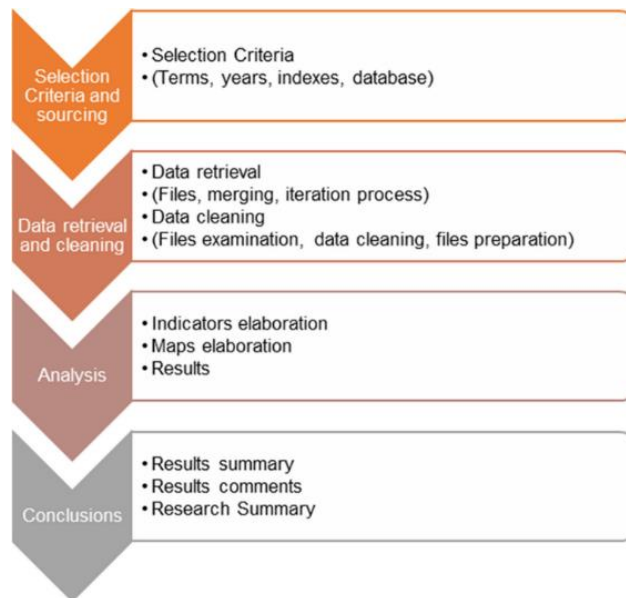


Figure 1. Methodology according to (Danvila-del-Valle et al., 2019)

2.5. Data Inclusion Criteria

The systematic literature review considers various research designs reviewed based on the following inclusion criteria.

Table 3. Inclusion & exclusion criteria

Type	Inclusion	Exclusion
File Type	Research article	Besides research articles
Scope	Article discussing the development of life skills through sports.	An article that only discusses the physical aspects of sports without relating them to life skills or character development.
Participant	Children, teenagers, school students, and young athletes involved in formal or informal sports programs.	Study with participants unrelated to sports (misalnya, Population umum yang tidak terlibat dalam program olahraga).
Index	Articles indexed in academic databases such as Scopus, Web of Science, PubMed, or Google Scholar.	Articles that are not indexed in recognized scientific journals or from non-credible sources.
Year of Publication	Articles published in the last 10 years (2014-2024) to obtain relevant and up-to-date data.	Articles published before 2014, except for key literature that is highly influential in the field.
Research Variable	Article that examines the variables of life skills (leadership, teamwork, emotional regulation, self-discipline) in the context of sports or physical education.	Articles that only focus on physical aspects such as fitness, motor skills, or sports achievements without linking them to the development of life skills.
Language	Article in English Relevant for Researchers	Articles written in languages other than English that are relevant to researchers
Context	Article discussing the context of sports in schools, communities, or structured sports programs focusing on children and adolescents.	Articles that only focus on sports at the professional level or elite athletes without discussing the development of life skills.
Type of Study	Quantitative, qualitative, or mixed studies based on empirical data.	Articles or reports that do not use a clear research approach, such as studies without empirical analysis.
Accessibility	Articles that are fully accessible (open access) or through limited access in the available academic database.	Articles that are not available in full-text format or cannot be accessed publicly or through academic institutions.

In this process, duplicate files are discarded. The study selection process consists of screening titles and abstracts identified during the search. Full-text studies that are potentially relevant are independently assessed for eligibility on the Covidence website (<https://www.covidence.org/>). Differences in article selection are discussed until a consensus is reached. Figure 2 shows the sampling process used. After removing duplicates and excluding records based on abstracts and titles, a total of 21 articles were selected. Here is PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) to guide the research:

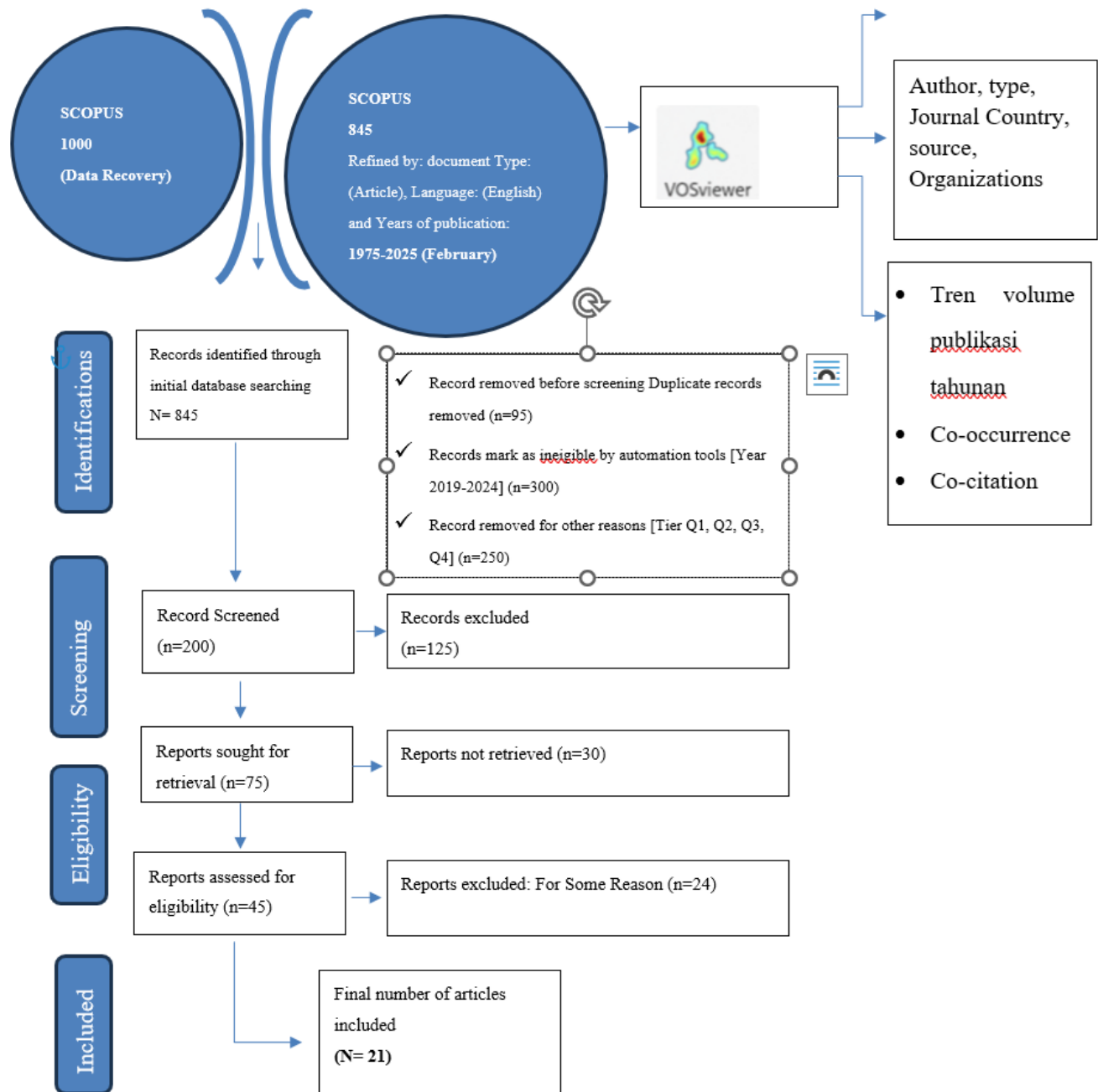


Figure 2. Search and Study Selection Process Using the PRISMA Flowchart

3. RESULTS

This section combines the results and commentary, since we contend this is the most efficacious method to present and evaluate the studied data from our study approach. We analyze overall trends, leading authors based on publication and citation counts, keywords indicative of significant topics, and maps illustrating the distribution of highly cited documents and citations. Additionally, we explore interconnectedness networks that represent groups of co-authors, countries,

and institutions, discussing each topic as we present our findings.

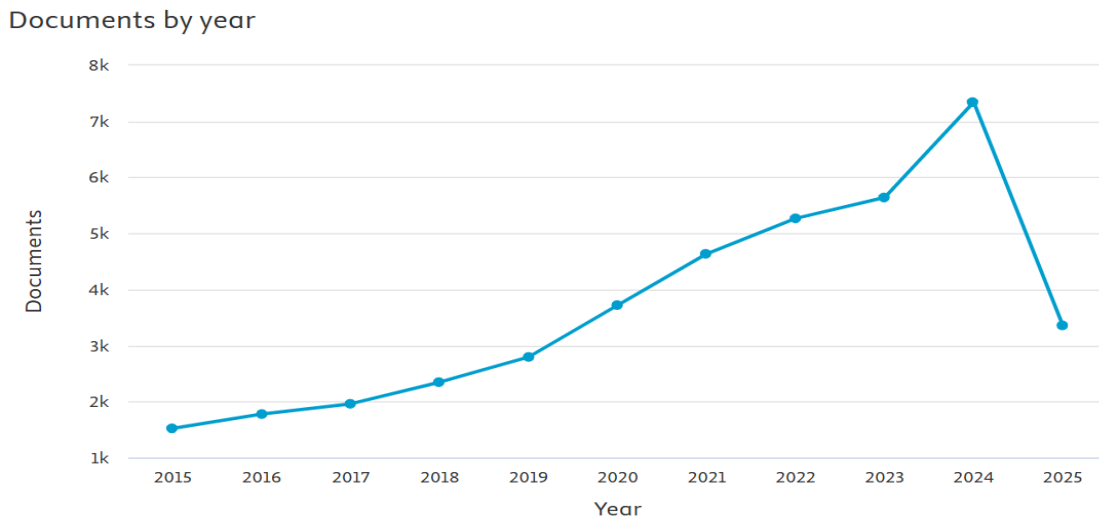


Figure 3. Overall Trend 2015-2025

Overall Trend: The number of publications increased significantly from 1,523 articles in 2015 to a peak of 7,343 articles in 2024, representing a 382.14% growth over the decade. This upward trajectory reflects the rising recognition of sport as a vehicle for fostering life skills, particularly in positive youth development (PYD) contexts. **Peak Year:** 2024 saw the highest output with 7,343 articles (20.63% of the total), followed by 2023 (5,642 articles, 15.85%) and 2022 (5,269 articles, 14.80%), indicating a surge in research interest in recent years. **Significant Growth Periods:** A notable increase occurred from 2019 (2,797 articles) to 2020 (3,722 articles), a 33.07% rise, likely influenced by global discussions on youth resilience during the COVID-19 pandemic. The largest year-on-year growth was from 2023 to 2024 (30.15%). **2025 Decline:** The drop to 3,360 articles in 2025 (9.44%) may be due to incomplete data, as the year is only partially covered (up to May 26, 2025). **Interesting Fact:** The sharp rise from 2019 to 2020 suggests that sport-based interventions gained attention during the pandemic as a means to support mental and social well-being, highlighting the field's relevance in addressing societal challenges.

Implications for the SLR: The consistent growth in publications from 2015 to 2024 underscores the increasing academic and societal focus on life skill development through sport, aligning with the SLR's exploration of current status and future directions. The peak in 2024 indicates a maturing field, while the 2025 dip should be interpreted cautiously due to potential data

incompleteness. The trend suggests opportunities for future research to explore emerging areas, such as technology-driven interventions (e.g., virtual reality in sports training) or inclusive programs for diverse populations.

Complementary Insights: When combined with the subject area analysis, the publication trends highlight that the growth in research, particularly in Medicine (15,627 articles), Social Sciences (14,291 articles), and Psychology (9,928 articles), reflects a multidisciplinary interest in the health, societal, and psychological benefits of sport. The surge in publications aligns with global trends emphasizing holistic youth development, reinforcing the SLR's focus on mapping the current research landscape and identifying future directions.

The most influential authors and journals

The analysis focuses on identifying leading authors and their contributions in terms of productivity, impact, and collaboration. It supports Research Question 1 (RQ1) of the Systematic Literature Review (SLR), which is titled "An Exploration of Life Skill Development Through Sport: Current Status and Future Directions."

Ten important authors are highlighted in the data; their research output (documents), citation impact, and collaboration networks (total link strength) all demonstrate their substantial contributions to the field. In terms of productivity, Keith Davids is at the top with 74 documents, followed by Martin Camiré with 58, Fernando Santos and Michael J. Duncan with 54, and Lisa M. Barnett with 48. With Davids and Camiré being especially prolific, this range (16 to 74 documents) reflects different levels of research output.

Despite having the fewest documents (16), Jessica Fraser-Thomas stands out in terms of impact with 1,763 citations, indicating that her work is highly influential, perhaps as a result of groundbreaking studies or reviews. Martin Camiré has 1,272 citations (58 documents), Tarkington J. Newman has 901 citations (38 documents), and Corliss Bean comes in second with 1,417 citations (30 documents). High productivity does not always translate into high impact, as evidenced by the range of citation counts from 276 (Duncan) to 1,763 (Fraser-Thomas).

Fernando Santos leads in collaboration strength with an exceptionally high total link strength of 212,221, suggesting extensive networks of collaboration that may be connected to international research in nations such as Portugal (as indicated by previous data). While Tanya Forneris (1,241) and Keith Davids (1,298) have lower link strengths despite high productivity, indicating more independent or focused research networks, Martin Camiré (25,995), Tarkington J. Newman (13,951),

and Leisha Strachan (9,324) also exhibit strong collaboration. Significant variations in the intensity of collaboration are highlighted by the large range in link strength (1,241 to 212,221).

Notably, the total link strength, citations, and documents do not strongly correlate. For example, Santos's high link strength greatly outweighs others', probably due to his pivotal role in international collaborations, while Fraser-Thomas's high citations contrast with her low document count. Santos's exceptional link strength is an intriguing finding that might point to frequent co-authorship or thematic connections (such as youth sport and life skills) in bibliometric networks.

According to these findings, Keith Davids, Jessica Fraser-Thomas, and Fernando Santos are important players for the SLR; Davids drives volume, Fraser-Thomas produces work with a significant impact, and Santos cultivates wide networks. In order to address RQ1 (leading authors), RQ3 (bibliographic and social structures), and RQ4 (key works), their publications are essential. The data highlights the expanding, interdisciplinary nature of the field when combined with previous analyses (e.g., publication trends peaking in 2024 and dominant subject areas like Social Sciences and Psychology). The rise in research output is consistent with the prominence of authors in high-impact journals such as the *Journal of Applied Sport Psychology*, indicating that their work influences present trends and future paths. Future studies could examine why some well-known writers receive fewer citations or have weaker links, as well as how Santos' partnerships can support international research initiatives on the development of life skills via athletics.

Table 6. Authors with the most publications, citations and total link strength

Author	Documents	Citations	Total link strength
Camiré, Martin	58	1272	25995
Bean, Corliss	30	1417	1752
Forneris, Tanya	25	871	1241
Santos, Fernando	54	480	212221
Barnett, Lisa M	48	305	3938
Davids, Keith	74	704	1298
Duncan, Michael J	54	276	4072
Fraser-Thomas, Jessica	16	1763	7661
Newman, Tarkington J	38	901	13951
Strachan, Leisha	19	220	9324

Distribution of publications by country and affiliation based on the most documents

Figure 5 shows which countries and institutional affiliations have produced the highest number of publications on the topic being analyzed.

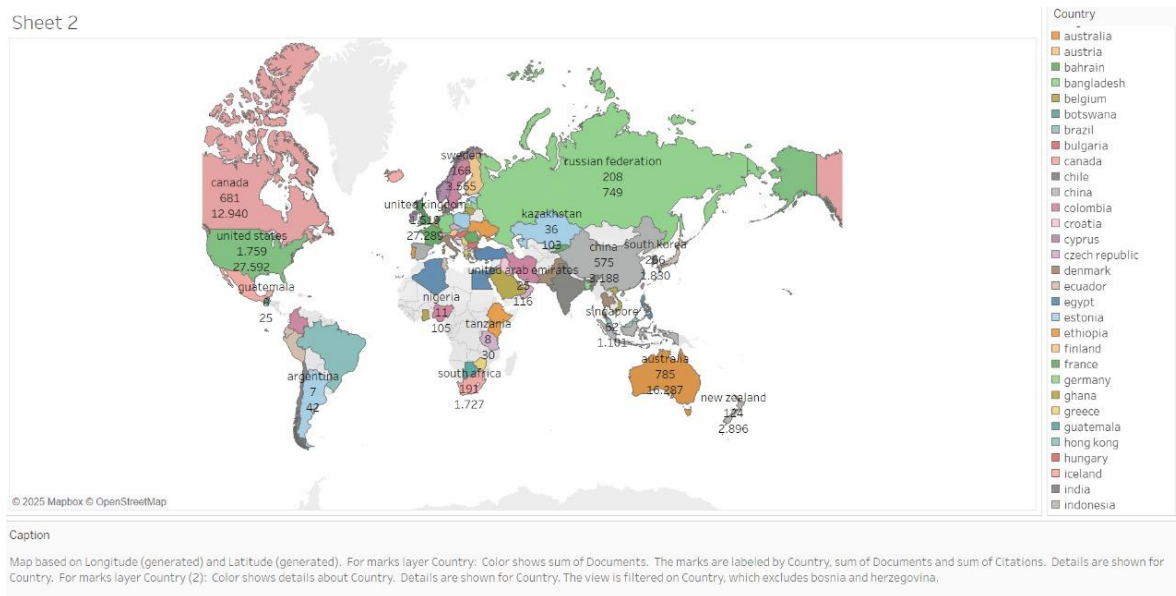


Figure 5. Map of country distribution based on the number of publications and citations

This description supports Research Question 2 (RQ2) of the Systematic Literature Review (SLR) titled "An Exploration of Life Skill Development Through Sport: Current Status and Future Directions", focusing on identifying the countries contributing most to the scientific output in this field. The data covers 108 countries/territories, with publication counts ranging from 2 to 8,522 articles, plus an "Undefined" category with 187 articles. The United States leads with 8,522 articles (22.34% of the total), followed by the United Kingdom (5,305 articles, 13.90%), Australia (3,553 articles, 9.31%), China (3,279 articles, 8.59%), and Spain (2,968 articles, 7.78%). Canada (2,616 articles, 6.85%), Germany (2,158 articles, 5.65%), Italy (1,553 articles, 4.07%), the Netherlands (1,352 articles, 3.54%), and Portugal (1,135 articles, 2.97%) also rank among the top contributors, reflecting strong research activity in North America and Europe. Together, these regions account for approximately 68.49% of the total output, highlighting their dominance in the field. Emerging contributors include Indonesia (1,104 articles, 2.89%), Malaysia (876 articles, 2.30%), and South Africa (756 articles, 1.98%), which are notable for developing nations, suggesting growing interest in sport-based youth development in diverse socio-economic contexts. Other regions, such as Latin America (e.g., Brazil: 1,112 articles, Chile: 417 articles) and the Middle East (e.g., Iran: 916 articles, Saudi Arabia: 450 articles), show moderate contributions, while Africa (e.g., Ghana: 142 articles, Nigeria: 139 articles) is less represented. Countries like Aruba, Burkina Faso, and Seychelles have minimal output (2–3 articles), likely due to limited research infrastructure.

An interesting observation is Indonesia's unexpectedly high contribution (1,104 articles), surpassing countries like France (929 articles) and Japan (779 articles). This suggests a regional emphasis on sport as a tool for life skill development, possibly tied to educational or community programs, offering a unique perspective for the SLR.

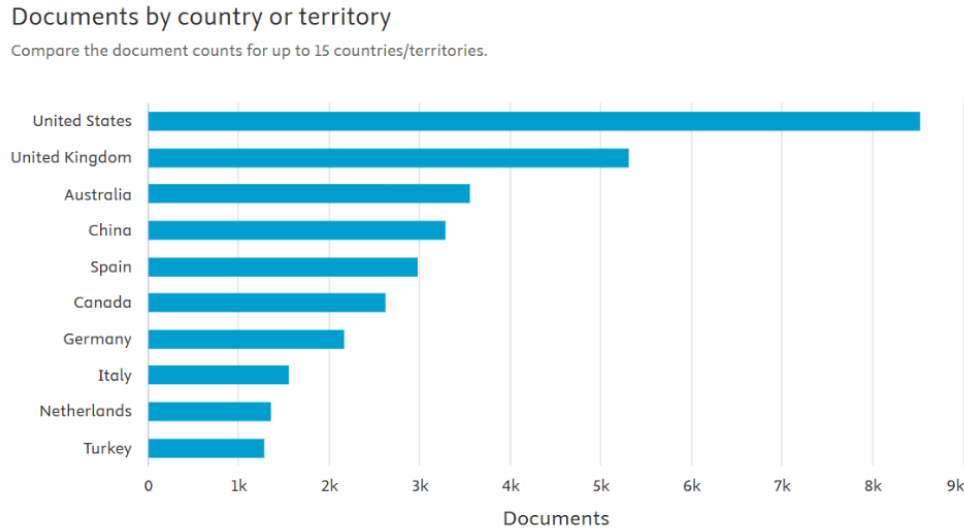


Figure 6. Documents by country

The trend of publications in physical education related to the implementation of character education for students is depicted in Figure 3. Through a visual analysis using VOSviewer, it is evident that the 2020-2021 period showed a considerable level of publication activity, especially on character education models integrated within physical education. A significant increase was observed in 2023-2024, with an emphasis on sports pedagogy and applied ethics. Educators and researchers in character education have increasingly focused on the crucial role of physical education. This study gathered data from 21 articles authored by researchers from six countries, focusing on character-based physical education models, the development of personal and social responsibility, the effectiveness of the Sport Education model in character building, the integration of character values into physical education learning, and physical education teachers' perspectives on character education. The findings highlight the importance and influence of these articles within this research field, with the article from (Muhtar & Dallyono, 2020) being the most frequently cited, with a total of 102 citations.

RQ1. Research Topics in Physical Education on Character Education.

To identify research topics, a keyword clustering analysis was conducted on the collected data. This analysis revealed five main themes of research in the field of physical education related to

the implementation of character education for students, represented by different colors (red, purple, blue, green, and yellow) in Figure 7.

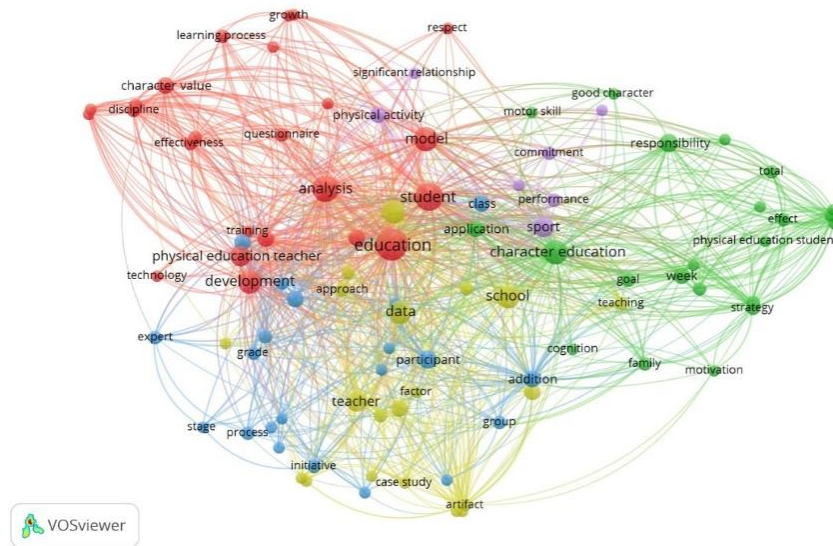


Figure 7. Keyword clusters in the field of Physical Education towards Character Education

Figure 7 shows several groups or clusters, each marked with a different color to indicate sets of terms that frequently co-occur in the research. The red cluster, for example, focuses on words such as "development," "physical education teacher," "character values," and "analysis." This cluster reflects research on development in physical education, where analysis, training, and character values play a crucial role, also including terms like "questionnaire" and "discipline," which indicate research methods in character education.

The green cluster centers on terms related to character education through sports, such as "sport," "responsibility," "good character," and "school." This suggests research related to the role of physical education and sports in shaping students' character, including responsibility and the effects of sports on character development. The yellow cluster points to general education aspects with words like "education," "data," "teacher," and "participant," indicating research that involves teachers, students, and data collection in education.

Finally, the blue cluster contains terms like "expert," "process," "initiative," and "grade," indicating its connection to educational initiatives and evaluations based on specific criteria. Overall, this visualization reveals key research patterns in education, particularly in physical education and character education.

RQ2. Who are the authors, countries, journals, and the most influential publications related to physical education and character education for students?

Figure 8 cites authors, journals, or publication across multiple articles indicates a citation relationship, reflecting the interconnectedness of scholarly works within a specific research domain (Lund & Maurya, 2020).

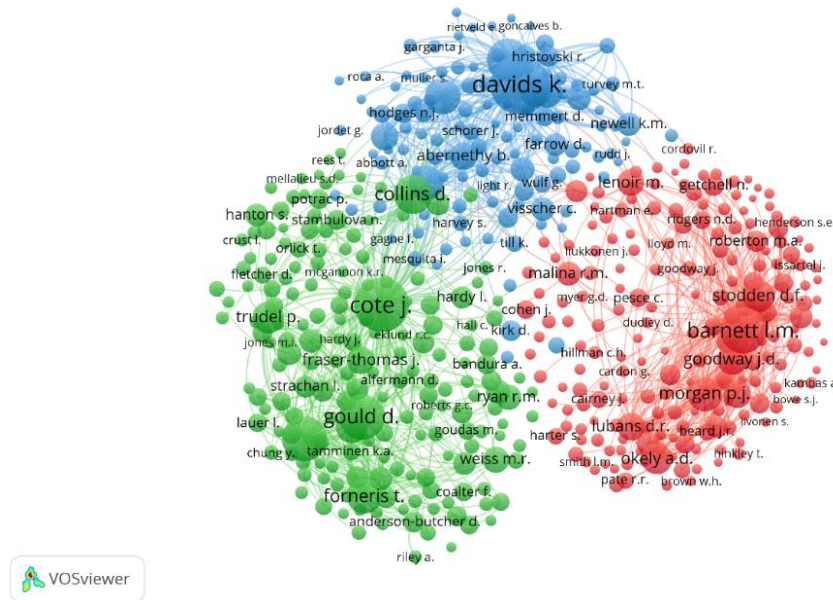


Figure 8. author clusters in the field of Physical Education towards Character Education

Citation network analysis reveals the relationships among authors, journals, and publications, highlighting the prominence and influence of particular works in the field of research (McLaren & Bruner, 2022). In this section, we conduct a co-occurrence analysis to identify the most influential authors, journals, and publications in the field of physical education related to character education. In this visualization, nodes represent individual authors, and the links between nodes indicate co-citation relationships. Larger nodes, such as K. Davids and G. Wulf, suggest these authors are frequently co-cited, highlighting their significant influence and central role in the research network. The proximity of nodes, such as the close relationship between N.J. Hodges and K.M. Newell, indicates strong co-citation ties, reflecting shared research themes or collaborative focus areas. Clusters of authors, such as R.M. Ryan, D. Gould, and S. Harter, may represent distinct research subfields, such as motivation in sports or skill acquisition.

The analysis also identifies emerging or less central figures, such as J. Goodway and L. Hardy, who may represent niche areas or newer contributions to the field. The visualization highlights the interconnectedness of the research community, with authors like M. Lenoir and D. Collins bridging different clusters, suggesting interdisciplinary connections.

Author co-citation network analysis

The citation network analysis of authors in the fields of character education and physical education during the period of 2019-2024 reveals several important patterns in the development of research. Muhtar et al., 2020 emerges as one of the most influential researchers with a series of significant publications in 2020 and 2021. His research primarily focuses on the development of character-based physical education learning models in Indonesia, published in high-quality indexed journals. The work of (Muhtar et al., 2020) provides a comprehensive framework for character development within the context of physical education.

In the evolution of research, several main research groups have been identified. The first group focuses on the implementation of character education led by Muhtar and colleagues, along with contributions from (Marini et al., 2021). The second group explores sport-based character development, with significant contributions from (Lyu et al., 2023; Toy, 2023; Wei et al., 2020). The third group investigates the relationship between social justice and character formation, pioneered by (Bredemeier & Shields, 2019; Jeon et al., 2021).

Geographically, Indonesia emerges as a primary research hub in this field, with six studies conducted across various regions of the country. The United States also contributes significantly with four studies, followed by one study each from Turkey, two from China, one from South Korea, and one from Kazakhstan. This geographical diversity indicates that the topic of character education in physical education receives global attention with various perspectives and cultural contexts. Although Brunsdon appears as a relatively new contributor with publications in 2022-2023, his work has provided new perspectives in the theoretical development and practical implementation of character education within physical education settings. The collaboration among these researchers has resulted in a more comprehensive understanding of how character education can be effectively integrated into physical education programs.

Country analysis

Figure 9. The image produced from this VOSviewer analysis illustrates the connections among countries, grounded in a particular indicator, such as research collaboration or trade.

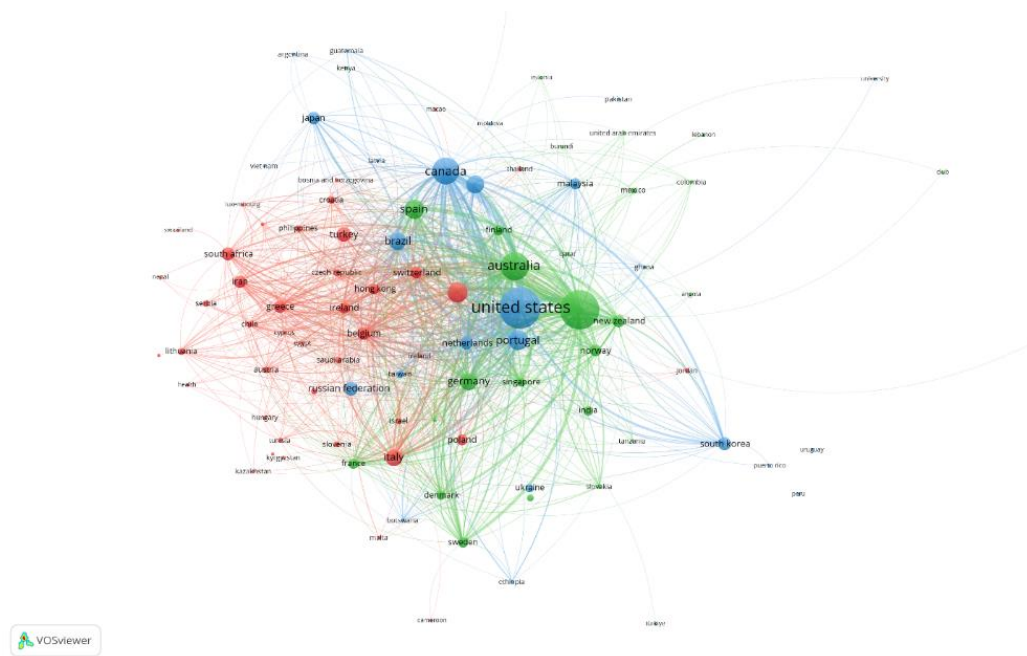


Figure 9. Country clusters in the field of Physical Education towards Character Education

Countries are categorized into various clusters represented by distinct colors, reflecting their interrelations within the global network. The green cluster, comprising the United States, Australia, Germany, and Portugal, exhibits significant connectivity and a broad range of relationships. The blue cluster, comprising countries such as Canada, Japan, and South Korea, exhibits significant interconnections among its members. In contrast, the red cluster, comprising Iran, Greece, and South Africa, exhibits a higher degree of isolation and possesses fewer connections relative to the other clusters. The dimensions of the nodes within the graph represent the engagement levels of various countries, with the United States positioned as the central figure exerting considerable influence in this network, trailed by Canada, Australia, and Germany.

The connectivity pattern indicates that nations within the green cluster exhibit robust inter-cluster relationships, whereas the blue cluster demonstrates strong internal connections while still maintaining a link to the green cluster. The red cluster seems to exhibit a more localized characteristic and demonstrates fewer connections. This analysis indicates that the United States and Western European countries are the primary players in international academic collaboration. If this pertains to trade, the nations within the green cluster emerge as the primary participants in the global economy. This examination reveals notable disparities in the degree of interconnectivity among nations, with certain countries serving as key hubs within the global framework, whereas others prioritize their regional affiliations.

RQ3. What are the specific research topics of Physical Education on character education and what are the future research directions?

In the analyzed studies, a total of 21 studies involving participants were identified, including 11 quantitative studies, 4 qualitative studies, and 3 studies employing mixed methods. Quantitative research is the most dominant method in this field. Overall, these 21 studies involved approximately 1,642 participants, with sample sizes ranging from 20 participants (Jeon et al., 2021) to 345 participants (Marini et al., 2021). Among the 15 studies analyzed, 8 of them used quantitative research methods, accounting for 53.3% of the total studies. Research on physical education (PE) focused on character education has rapidly developed. Various studies indicate that PE not only enhances physical skills but also the character of students.

One of the main topics is the relationship between sportsmanship and self-confidence. Toy (2023) found that sportsmanship is significantly predicted by external self-confidence, highlighting the importance of reinforcing confidence in building positive character. Liu et al. (2021) emphasizes personal and social responsibility in sports education, suggesting that teaching centered on character values can enhance students' self-efficacy. Kairgozhin et al. (2023) highlight cognitive independence, where interventions in PE lessons can increase students' motivation and cognitive activity. Wei et al. (2020) integrates the TPSR model in sports education, which enhances students' responsibility and independence. Meanwhile, Muhtar et al. (2021) show that many teachers do not have a clear character education teaching model, highlighting gaps in educational practice. Future research directions should focus on the application of effective character education models and the development of integrated curricula. Muhtar & Dallyono (2020) indicate that teachers' understanding significantly influences the implementation of character education in the classroom.

Overall, this research demonstrates the great potential of physical education in shaping students' character. Moving forward, studies need to identify best practices and strengthen the role of teachers as agents of change in character education.

Overview of Included Articles

This Systematic Literature Review (SLR) includes a wide range of studies that look at how sports can help people develop life skills. These studies come from different populations, use different methods, and take place in different parts of the world. The studies are published in well-known journals like the International Journal of Sports Science & Coaching, the Journal of Applied Sport Psychology, the Journal of Sports Sciences, the International Review of Sport and Exercise

Psychology, The Sport Psychologist, Quest, the European Physical Education Review, Sport, Exercise, and Performance Psychology, BMC Public Health, and Qualitative Research in Sport, Exercise and Health. The quality indices for these journals range from Q1 to 4, where specified. The study looks at the topic from a global point of view by including data from Portugal, the US, Canada, the UK, Italy, Australia, the Netherlands, and China.

The groups studied are different and include young athletes (ages 6 to 23), high school student-athletes, socially vulnerable youth, coaches, and teacher-coaches. Sample sizes can be as small as 12 teacher-coaches or 20 students or as big as 1,238 coaches or 317 youth soccer players. The methods used include qualitative approaches (like semi-structured interviews and grounded theory), quantitative designs (like group-randomized trials and structural equation modeling), and mixed-methods studies. These methods give a thorough look at how life skills are learned and transferred.

Key findings show that programs based on sports can help people learn important life skills like teamwork, leadership, making decisions, and controlling themselves. Studies show that skill development and transfer to non-sport situations like school and everyday life are more likely to happen when programs have clear goals, coaches and athletes have good relationships, and environments are supportive (for example, when peers and parents are involved). For example, a Positive Youth Development (PYD) coach education course made coaches act better, and mastery climates created by peers had a big effect on how well people learned life skills. Research also shows that outcomes can be improved by clearly teaching strategies and working together with stakeholders like parents and sports leaders. Some studies find problems with skill transfer, like not teaching on purpose or cognitive disconnects. They also suggest ways to move forward, like doing long-term research and qualitative studies of cognitive processes.

In general, the studies included give us a full picture of the current state of life skill development through sports. They show us the best ways to do things, the most important factors that affect them, and the areas where more research is needed to improve the outcomes for young people.

Table 7. Overview of included articles

Title	Positive youth development related athlete experiences and coach behaviors following a targeted coach education course.	Research on Positive Youth Development-focused Coach Education Programs Future Pathways and Applications.	Teacher-Coaches' Perceptions of Life Skills Transfer from High School Sport to the Classroom.	Transfer of Life Skills in Sport-Based Youth Development Programs: A Conceptual Framework Bridging Learning to Application	Youth Life Skills Training Exploring Outcomes and Mediating Mechanisms of a Group-Randomized Trial in Physical Education
Journal	Journal Name: International Journal of Sports Science Coaching Quality Index: Not specified in the provided contexts.	Journal Name: International Sport Coaching Journal-Human Kinetics Quality Index: 2	Journal Name: Journal of Applied Sport Psychology. Quality Index: 1	Journal Name: Quest Quality Index: 1	Journal Name: Sport, Exercise, and Performance Psychology. Quality Index: Not specified in the provided contexts.
Country	Portugal.	Portugal	Midwestern state in the United States.	Amerika Serikat	Italy
Population	The study involved 14 coaches and 270 athletes from Portugal, with eight coaches managing 154 athletes in the control group and six coaches overseeing 116 athletes in the experimental group.	Youth	The study's participants were 12 teacher-coaches from a Midwestern U.S. state (9 males, 3 females), averaging 35.6 years of age with 13 years of teaching experience and 13.25 years of coaching experience across various sports.	Youth	The population for the study consisted of 109 senior high school students aged 14-15 years from a Rome urban school.

Methods	The study used a mixed-methods approach, collecting quantitative data via questionnaires on athlete experiences and coach behaviors, analyzed with mixed ANOVAs to compare intervention and control groups over time.	The contexts provided do not specify the research methodology (quantitative, qualitative, or mixed methods) used in the study on positive youth development (PYD)-focused coach education programs	The study used a qualitative approach with in-person, semi-structured interviews of 12 teacher-coaches to explore their views on life skills transfer from sports to the classroom, applying a constructivist perspective to examine influencing factors.	The paper highlights the need for qualitative methods, like interviews and case studies, to explore how youth cognitively connect life skills to everyday life.	The study used a quantitative, group-randomized trial design to evaluate the impact of a life skills program in physical education, analyzed using general linear models and mixed-effects ANOVA.
Results	The study evaluated a Positive Youth Development (PYD) coach education course, finding that while coaches improved their PYD behaviors during the course, these returned to baseline levels at follow-up.	Research on positive youth development (PYD) in coach education emphasizes the need to involve various stakeholders, including parents and sport leaders, to enhance program effectiveness. This collaboration fosters a shared PYD philosophy, leading to better outcomes for youth athletes.	Teacher-coaches recognized that student-athletes can learn life skills from high school sports and apply them in the classroom. The study identified key factors influencing this transfer, categorized into three areas: student-athlete characteristics, high school sport factors, and classroom factors.	The research underscores the need to understand cognitive processes in transferring life skills from sport-based youth programs to non-sport settings, stressing that youth must perceive these skills as applicable beyond sports for effective transfer.	The life skills program in physical education significantly improved aerobic fitness, sport passing skills, and inhibitory function, with these gains mediated by enhanced decision-making skills.

Title	Informal sport and curriculum futures: An investigation of the knowledge, skills and understandings for participation and the possibilities for physical education.	Integrating life skills into Golf Canada's youth programs Insights into a successful research to practice partnership.	Is Life Skill Development a By-Product of Sport Participation Perceptions of Youth Sport Coaches	Life skills development and enjoyment in youth soccer: The importance of parental behaviours.	Perceptual-cognitive skill training and its transfer to expert performance in the field Future research directions.
Journal	Journal Name: European Physical Education Review Quality Index: 1	Journal Name: Journal of Sport Psychology in Action Quality Index: 4	Journal Name: Journal of Applied Sport Psychology Quality Index: 2	Journal Name: Journal of Sports Sciences Quality Index: 1	Journal Name: "European Journal of Sport Science." Quality Index: 2
Country	Australia	Canada,	Canada	England	United Kingdom (London)
Population	The research paper examines young people's participation in informal sports rather than traditional organized sports.	Young Golfers	The study involved a total of 23 youth sport coaches, with a demographic breakdown of 16 male and 7 female coaches.	The study's population included 317 youth soccer players, primarily male (315 males, 2 females), with an average age of 12.83 years (SD = 1.70) and an age range of 10 to 16 years.	This research involves athletes from sports like football, tennis, and badminton participating in perceptual-cognitive skills training to enhance their on-field performance.

Methods	The research uses a mixed-methods approach to assess skills in informal participation and analyze the alignment of the Australian Curriculum Health and Physical Education with participation trends.	The research uses a qualitative methodology to develop and integrate a life skills curriculum into Golf Canada's youth programs in partnership with the University of Ottawa.	The study used a qualitative methodology, specifically semi-structured interviews, to collect data from youth sport coaches.	The study employed a quantitative methodology to explore the relationships between parental behaviors and players' life skills development and enjoyment in youth soccer.	The study examines perceptual-cognitive skill training and its transfer to expert performance, discussing training techniques and effectiveness, but does not specify the methodology.
Results	The research found that informal sport participation fosters social skills, cultural understandings, and environmental knowledge, all crucial for sustained engagement.	The research integrated a life skills curriculum into Golf Canada's youth programs, developed collaboratively with the University of Ottawa, emphasizing effective communication and feedback.	The research revealed that youth sport coaches see life skills as a by-product of sport participation, often assuming automatic transfer to other areas. Although they acknowledge the need for intentional teaching, they usually address life skills reactively during practices.	The research found that youth soccer players identified eight life skills, including teamwork and leadership, as significantly influenced by parental behaviors such as praise and pressure.	The research indicates that perceptual-cognitive skill training enhances athletes' anticipation and decision-making, aiding skill transfer to real-world performance, though long-term retention remains under-explored.

Methodological Quality Evaluation

The criteria for assessing the quality of the included studies were adapted from the Consolidated Standards of Reporting Trials (CONSORT) statement (Moher et al., 2010) as used by (Pozo et al., 2018) The quality assessment criteria are: (a) Research relevance, (b) Methodological quality, (c) Inclusion of publication journals in quality-indexed journals, (d) Sample size, (e) Data analysis, and (f) Findings and interpretation. Each item is rated from 0 to 2 based on the criteria outlined in Table 2. The total score is calculated for each study depending on the number of positive

items it contains. Studies with a total score of 12 or higher are considered high quality (HQ); studies with a total score of 5–9 are considered of average quality (AQ); studies with a total score lower than 4 are considered low quality (LQ).

We conducted database searches in stages through several platforms during the identification research phase. In the first week, the search was conducted in the Scopus Database on September 17, 2024, followed by the second week's search in the Taylor & Francis Database on September 24, 2024, and in the third week, the search was conducted in the ERIC Database on October 1, 2024. Here are the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) results using the Covidence website to guide the research on the exploration of life skills development through sports:

Table 8. Quality assessment

9	8	7	6	5	4	3	2	1	No
(Kendellen et al., 2017)	(Bean & Forneris, 2017)	(40)	(Broadbent et al., 2015)	(MacDonald et al., 2020)	(Santos et al., 2019)	(Pierce et al., 2019)	(Jacobs & Wright, 2018)	(Pesce et al., 2016)	Author
2	2	2	2	2	2	2	2	2	Relevance
2	2	2	2	2	1	2	2	2	Quality of Methodology
2	2	1	2	0	2	1	2	0	Index
1	2	2	1	2	1	2	1	2	Sample Size
2	2	1	2	1	1	1	2	1	Data Analysis
2	2	2	2	1	2	2	2	2	Findings and Interpretation
11	12	10	11	9	9	10	11	9	Total Score
HQ	HQ	HQ	HQ	AQ	AQ	HQ	HQ	AQ	Quality Assessment

18	17	16	15	14	13	12	11	10	No
(Mossman et al., 2021)	(Newman et al., 2023b)	(Cronin & Allen, 2015)	(Allen et al., 2015)	(Super et al., 2014)	(Bean & Forneri, 2016)	(Super et al., 2018)	(Trottier & Robitaille, 2014)	(O'Connor & Penney, 2021)	Author
2	2	2	2	2	2	2	2	2	Relevance
2	0	1	2	1	2	2	2	2	Quality of Methodology
2	2	2	0	2	2	0	2	0	Index
2	0	2	2	1	2	1	2	2	Sample Size
2	1	2	1	2	2	2	2	1	Data Analysis
2	1	2	2	2	2	2	2	2	Findings and Interpretation
12	7	11	9	10	12	9	12	9	Total Score

HQ	AQ	HQ	AQ	HQ	HQ	AQ	HQ	AQ	Quality Assessment
						21	20	19	No
						(Holt et al., 2017b)	(Hayden et al., 2015)	(Camiré et al., 2019)	Author
						2	2	2	Relevance
						2	1	2	Quality of Methodology
						2	0	0	Index
						2	1	2	Sample Size
						2	1	2	Data Analysis
						2	0	2	Findings and Interpretation
						12	5	10	Total Score
						HQ	LQ	AQ	Quality Assessment

4. DISCUSSION

The trend of published research on physical education related to character education from 2019 to 2024 has developed through three phases. The initial development phase (2019-2020) focused on the basic implementation of character education within physical education. The mid-growth phase (2021-2022) was marked by an increase in research regarding character-based learning models and the integration of aspects of social justice. The high-growth phase (2023-2024) indicates more complex research focusing on human flourishing and applied ethics. The dominance of publications during the high-growth phase (two-thirds of the total) reflects a growing global awareness and the need for the development of effective learning models that integrate character values through physical education.

Based on the analysis of various research articles, a wide range of studies has been conducted across several countries regarding character education and physical education. These studies are distributed among countries such as Turkey, China, Kazakhstan, Indonesia, South Korea, and the United States, with the United States emerging as the most active location for research. In terms of methodology, researchers generally employ a comprehensive approach using mixed methods. This is evident from the combination of qualitative and quantitative approaches used to gain a deeper understanding of the topics being studied (Muhtar et al., 2020). Some studies also adopt experimental designs with control groups to test the effectiveness of various educational interventions (Kairgozhin et al., 2023; Liu et al., 2021). The diversity of research samples indicates a wide scope, ranging from 20 to 345 respondents, involving various educational levels from elementary school students to

university students. Some studies also involve teachers as respondents to obtain a more comprehensive perspective (Muhtar & Dallyono, 2020).

The main focus of the majority of research is character development through physical education, with several studies specifically examining the relationship between self-confidence and sportsmanship behavior (Toy, 2023). Other research includes the development of innovative learning models to enhance the effectiveness of character education within the context of physical education (Marini et al., 2021; Muhtar et al., 2020; Wei et al., 2020). The results consistently demonstrate a positive impact of character education on student development. Character-based learning models have proven effective in fostering positive values among students (Fizi et al., 2023b; Sujarwo et al., 2021). Additionally, a significant correlation was found between external self-confidence and sportsmanship behavior (Toy, 2023) as well as the successful integration of character education models within physical education (Liu et al., 2021).

In terms of research quality, the majority of articles are published in journals with a quality index of 1-3, with some indexed in international databases such as Scopus and Clarivate Analytics. The methodologies employed in these studies generally demonstrate good quality, utilizing appropriate methods and sufficient samples to support the validity of the research findings. Overall, various studies indicate that physical education has great potential in shaping students' character. Through integrated approaches and support from educators, physical education can foster positive values that contribute to the holistic development of students, both physically and morally.

Authors, Countries, Journals, and Influential Publications

In the context of physical education and character education, research from various countries shows diverse influences and contributions. For example, Muhtar et al. (2020) from Indonesia is one of the most influential authors, publishing several articles on character-based learning models for physical education, focusing on elementary schools. The distribution of research by country indicates that the United States ranks first with six studies, including those by (Bredemeier & Shields, 2019; Brunsdon & Walker, 2022; Hollett et al., 2020; Muhtar et al., 2021), which primarily focus on aspects of social justice and character development through physical education. The main journal utilized is the *International Journal of Human Movement and Sports Sciences*, highlighting the global importance of this theme, especially in Southeast Asia. Muhtar's research emphasizes that integrating character values such as responsibility, cooperation, and discipline is essential in physical education to support students' moral development.

Additionally, Bredemeier & Shields (2019) from the United States highlight the significance of social justice in character education through sports. Their publication in *QUEST* provides a strong foundation for a social justice-based perspective on character education, where sports serve not only as a physical activity but also as a means for ethical development and social justice. Their findings suggest that interactions among athletes within sports teams can cultivate important moral and social character traits. From Turkey, Gür (2022) in the *African Educational Research Journal* focuses on the relationship between sportsmanship and self-confidence among physical education students. The results indicate that sportsmanship can be influenced by an individual's level of self-confidence, particularly through external support. This underscores the importance of sportsmanship as an element of character building in sports.

This research demonstrates a variety of approaches to character education in physical education from different parts of the world. Each researcher brings a unique approach to integrating character values within the context of physical education, involving the development of learning models, the implementation of social values, and the understanding of teachers as agents of change.

Research Topics and Future Directions in Physical Education Regarding Student Character

Research in the field of physical education increasingly emphasizes its potential in shaping student character, encompassing aspects of sportsmanship, personal and social responsibility, and cognitive independence. According to Toy, (2023), self-confidence gained from external support, such as from coaches and peers, plays a crucial role in fostering students' sportsmanship. Recognition from the social environment can encourage students to respect the rules and their opponents, thereby demonstrating sportsmanlike behavior. A study by Liu et al. (2021) in China shows that personal and social responsibility can be developed through the Sport Education Model, where students are given the opportunity to independently manage roles within a team. This not only strengthens their sense of personal responsibility but also enhances their awareness of group contributions.

Meanwhile, research by Kairgozhin et al. (2023) in Kazakhstan found that physical education can also promote students' cognitive independence by teaching them to think and act autonomously. This approach has been shown to improve students' academic motivation and critical thinking skills in decision-making. On the other hand, Wei et al. (2020) emphasize a model of education with Social Responsibility (TPSR), which not only enhances students' responsibility and independence but also fosters cooperation and positive motivation. The TPSR model integrates values of caring for others and social responsibility into physical education learning.

However, a gap was identified by Muhtar et al. (2021), in the implementation of character education in physical education. Based on bibliometric analysis results from the Scopus database for 2011–2020, it was found that 86.6% of physical education teachers lack a clear character learning model. This results in suboptimal development of student character. Muhtar & Dallyono (2020) identify nine key characters that need to be developed, namely respect, responsibility, caring, honesty, fairness, politeness, self-confidence, togetherness, and religiosity. Additionally, Cho et al. (2022) mentions that there are seven psychosocial characteristics that need to be evaluated in physical education: diligence, empathy, cooperation, respect, challenge, emotional control, and leadership.

Looking to the future, the primary focus in physical education research should be on developing a more systematic character-based curriculum and adequate teacher training. These efforts aim to ensure that character values can be more effectively integrated into every physical education learning session, enabling students to grow not only as physically healthy individuals but also with strong ethical values and social responsibilities.

5. CONCLUSIONS

Sports play an important role in the development of life skills in adolescents, especially in the context of Positive Youth Development. (PYD). Through participation in structured sports, life skills such as leadership, self-control, emotional management, and social skills can be developed. This research highlights the importance of deliberately designed sports programs that focus on explicit teaching of life skills, rather than just relying on implicit learning. Additionally, the transfer of life skills to non-sport contexts requires participants to be aware of the relevance and benefits of these skills outside of sports. Sports programs that successfully facilitate the development of life skills can also play a role in improving the mental and physical well-being of adolescents, especially those from socially vulnerable groups. Coaches, teachers, and parents play an important role in creating an environment that supports the development and transfer of life skills. Therefore, a multidimensional approach involving various stakeholders is necessary to maximize the positive impact of sports programs on youth development.

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