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# Analysis of design and implementation of physical education curriculum in primary school: A literature study

# Análisis del diseño y la aplicación del plan de estudios de educación física en la escuela primaria: Un estudio bibliográfico

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**Abstract.** Physical education is a vital component of the primary school curriculum, aiming to develop students' physical skills, health, and psychosocial well-being. Various approaches have been implemented to achieve these goals, including curriculum integration and addressing the challenges within the primary school curriculum. This study aims to systematically analyze the design and implementation of physical education curriculum in primary schools by reviewing 20 research articles, with a focus on identifying practices and challenges encountered. The methodology used follows a systematic review guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework. Relevant research articles were identified through a Scopus database search using specific keywords, followed by predefined inclusion and exclusion criteria. The analysis results indicate that physical education curriculum approaches are diverse, including health-based and mindfulness curricula, ecological dynamics approaches, alternative curricula, and integration with specific models or policy foundations, all aiming to have a positive impact on the physical, cognitive, social, and emotional development of primary school students by incorporating biomechanical concepts, conflict management strategies, integration of thinking skills, and motor skill development. Additionally, teacher preferences regarding the implementation of physical education curricula were also found. This review concludes that various approaches to implementing physical education curricula positively affect student development. The findings highlight that an effective primary school physical education curriculum should integrate a holistic approach involving physical, cognitive, social, and emotional aspects. The importance of flexibility in the curriculum, allowing adaptation to local and individual student needs, is also acknowledged.
**Keywords:** physical education, curriculum, primary school, literature review

**Resumen.** La educación física es un componente vital del plan de estudios de la escuela primaria, cuyo objetivo es desarrollar las aptitudes físicas, la salud y el bienestar psicosocial de los alumnos. Se han aplicado diversos enfoques para lograr estos objetivos, incluida la integración, así como los retos del currículo de la escuela primaria. Esta revisión tuvo como objetivo analizar sistemáticamente el diseño y la implementación de los currículos de educación física en las escuelas primarias a partir de 20 artículos de investigación, con un enfoque en la identificación de prácticas y desafíos enfrentados. El método utilizado fue una revisión sistemática que utilizó las directrices de los Elementos de Información Preferidos para Revisiones Sistemáticas y Metaanálisis (PRISMA). Los artículos de investigación pertinentes se identificaron mediante búsquedas en la base de datos Scopus utilizando palabras clave específicas y siguiendo los criterios de inclusión y exclusión establecidos. El análisis de la revisión mostró que los enfoques curriculares de la educación física son diversos, como los currículos basados en la salud y la atención plena, los enfoques de dinámicas ecológicas, los currículos alternativos, la integración con modelos específicos y las bases políticas con la intención de tener un impacto positivo en el desarrollo físico, cognitivo, social y emocional de los alumnos de primaria. Además, estos enfoques también incorporan conceptos biomecánicos, estrategias de manejo de conflictos, integración de habilidades de pensamiento y desarrollo de habilidades motoras. También se encontraron las preferencias curriculares de los profesores en sus opiniones sobre la implementación del currículo de educación física. La revisión halló que diversos enfoques para implementar el plan de estudios de educación física tienen un impacto positivo en el desarrollo de los alumnos. La conclusión de esta revisión destaca que un plan de estudios de educación física eficaz en la escuela primaria debe integrar un enfoque holístico que incluya aspectos físicos, cognitivos, sociales y emocionales. También se reconoció la importancia de la flexibilidad en el plan de estudios que permite la adaptación según las necesidades locales e individuales de los alumnos.
**Palabras clave:** educación física, plan de estudio, escuela primaria, revisión de la literatura

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## Introduction

Physical Education (PE) is a critical component of the primary school curriculum, aimed at developing students' physical skills, health, and psychosocial well-being (García-Hermoso et al., 2020; Lieberman et al., 2024; Pickup & Randall, 2022; Zhang et al., 2020). The integration of PE into national curricula across various countries reflects a commitment to holistic education that promotes a balance between cognitive, affective, and psychomotor aspects (Oh & Graber, 2019; Siedentop & Van der Mars, 2022; Whatman & Dinan-Thompson, 2019). Additionally, physical education plays a pivotal role in encouraging active and healthy lifestyles among students from an early age (Li et al., 2019; Widiyatmoko et al., 2020), which can reduce the risk of lifestyle-related diseases in the future (Corbin, 2021). PE programs also support social development through activities that facilitate social interaction and teamwork, building self-confidence and communication skills (Bessa et al., 2021; Cañabate et al., 2018; D'Isanto et al., 2022; Opstoel et al., 2020; Sohrabi, 2019). Thus, physical education not only provides a foundation for physical skills but also enhances mental and social health, which are all crucial for the overall development of students (Kemel et

al., 2022; Røset et al., 2020).

The importance of physical education extends beyond physical development; it significantly contributes to academic achievement (Zach et al., 2017), character building (Nurafiati et al., 2021), and students' psychological well-being (Piñeiro-Cossio et al., 2021). Well-designed PE activities can improve concentration (Polevoy et al., 2023), memory (Zhao & Li, 2018), and cognitive abilities, thereby indirectly supporting academic success (García-Hermoso et al., 2021). Moreover, through games and sports, students learn about integrity, cooperation, and leadership (Bukhari et al., 2019; Engels & Freund, 2020; Griggs & Randall, 2019), which are essential elements in character development (Purwanto & Susanto, 2020). Emotional health is also shaped through participation in PE, where social interactions and peer support can reduce stress and enhance self-confidence (Lang et al., 2019). Therefore, the effective design and implementation of the PE curriculum are crucial to achieving educational goals, ensuring that every student has the opportunity to develop comprehensively in physical, academic, character, and emotional aspects. Thus, physical education is not just about sports but about shaping healthy, intelligent, and morally upright individuals.

Although the design and implementation of PE curricula aim for universal goals in developing students' physical skills, health, and psychosocial well-being, the specific methods applied in practice can vary significantly (Colquitt et al., 2017), depending on national context (Merino-Barrero et al., 2019), educational policies, available resources, and the unique needs of the student population. In some cases, highly structured and competition-based PE curricula may be preferred to promote sportsmanship and physical excellence (Aggerholm et al., 2018; Barney et al., 2019). Conversely, some educational systems may adopt a more inclusive and participation-focused approach, emphasizing the importance of physical health and fitness for all students (Deutsch et al., 2019; Greier et al., 2020; Kirk, 2017), not just those who show athletic talent. These variations raise critical questions about the relative effectiveness of different approaches adopted in primary schools, particularly in the context of achieving overall educational goals. Therefore, it is essential to evaluate and compare the outcomes of various PE curriculum models to identify best practices that can be adapted or modified according to local conditions.

The purpose of this literature review is to identify and analyze the various approaches to implementing the PE curriculum in primary schools. Additionally, it provides valuable insights for educators, policymakers, and curriculum developers to enhance the quality and efficacy of physical education globally (Bertills et al., 2018), emphasizing its crucial role in supporting the holistic development and well-being of primary school students (Kliziene et al., 2021). Furthermore, this review aims to evaluate the effectiveness of each approach in achieving comprehensive educational goals, including the physical, cognitive, social, and emotional development of students. Through this critical analysis, it is hoped that best practices can be identified and adapted or modified to enhance the quality and relevance of physical education in the future.

## Materials and methods

### *Search strategy*

In this literature review, the search for articles was conducted using the Harzing's Publish or Perish (PoP) application. The search was based on the Scopus database, which is considered one of the leading citation indexing systems with the highest quality (Kang et al., 2015; Schotten et al., 2017; Shestakova et al., 2023). This source is frequently consulted by researchers worldwide. The search strategy utilized the keywords: curriculum AND ("physical education" OR "PE") AND (primary OR elementary OR child*) AND school. The search was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Sarkis-Onofre et al., 2021). Utilizing the PRISMA guidelines results in more transparent, comprehensive, and accurate reporting of systematic reviews, facilitating evidence-based decision-making (Page et al., 2021).

### *Inclusion criteria*

The inclusion criteria for this literature review were: (1) Discussing the implementation of the curriculum; (2) Focusing on the field of physical education; (3) Targeting the primary school level; and (4) Publications that are research articles. This study focuses solely on physical education at the elementary school level to ensure a detailed analysis of the curriculum's implementation. Therefore, only studies addressing elementary school physical education were included.

### *Exclusion criteria*

The exclusion criteria for the article search were: (1) Articles not research outputs from Scopus-indexed databases; (2) Articles not specifically targeting the primary school level; and (3) Articles not discussing the implementation of the primary school physical education curriculum. The objectives of the elementary physical education curriculum differ significantly from those at higher education levels. As a result, studies related to physical education at secondary or tertiary levels were excluded to maintain a specific focus on elementary education.

### *Procedure*

The initial search was conducted using the predefined keywords with a publication year restriction of 2019-2023 via the PoP software (accessed in May 2024). This search yielded 475 publications from the Scopus database. After applying the exclusion criteria, only 20 articles were found to be relevant to the review topic. Most articles were excluded because they did not meet the criteria for studies on the implementation of the primary school physical education curriculum.

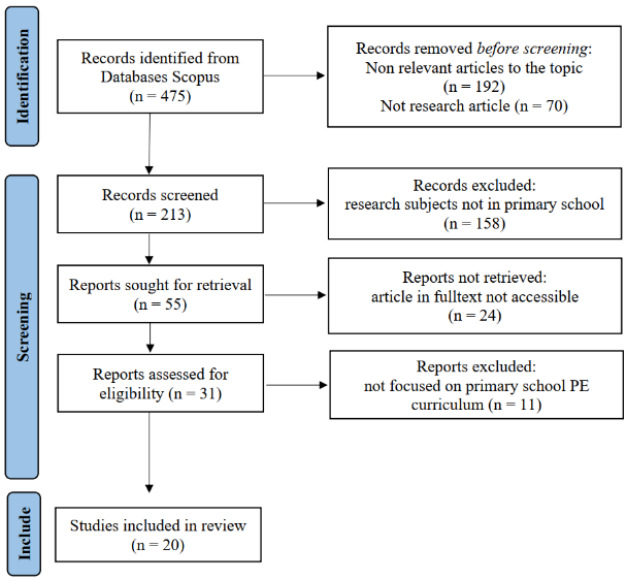


Figure 1. PRISMA flowchart for reviewing articles

The bibliometric analysis involved collecting key data from each screened article, including: authors, publication year, content, methods, objectives, and results. This data was then organized into a table to facilitate comparison and thematic analysis. Authors and Year: to provide context and traceability of the studies. Content: analyzed to identify the main theme or research focus. Methods: including the type of research (quantitative, qualitative, or mixed), design, and data collection techniques. Objectives: outlines the specific goals each study aimed to achieve. Results: summarizes the key findings of each study.

Analysis with VOSviewer was conducted to visualize the relationships and co-occurrences between key terms and concepts identified in the bibliometric data. The purpose of the VOSviewer analysis is to map out the research landscape, identify clusters of related topics, and highlight emerging trends within the field.

### *Data extraction and analysis*

The selected articles were meticulously reviewed and analyzed to extract relevant data regarding the implementation strategies, outcomes, and practices of physical education curricula in primary schools. This process involved: Identifying key themes and patterns within the selected studies, Summarizing the methodologies and findings of each study. Synthesizing the results to provide a comprehensive overview of the current state of physical education curriculum implementation in primary schools. By critically assessing the diverse approaches and their outcomes, this review aims to contribute to the enhancement of physical education programs, ensuring they are well-aligned with educational goals and responsive to the needs of students.

## Results

The analysis of articles on the study of physical education curriculum in primary schools from 2019 to 2023 is summarized as follows. Summary of the selected research articles review presented based on Content, Research Method, Research Objective, and Research Results.

Table 1.
Articles Data Based on Contents

| Article Number | Author(s) and Year | Content |
|---|---|---|
| Article 1 | (Chick et al., 2022) | Health and mindfulness curriculum |
| Article 2 | (Davies et al., 2023) | Physical education curriculum based on motor learning theory |
| Article 3 | (Adamčák et al., 2023) | Curriculum preferences of primary school physical education (PE) teachers |
| Article 4 | (Oppici et al., 2020) | Effectiveness of dance PE curriculum in children |
| Article 5 | (Marković et al., 2023). | Efficiency of alternative physical education programs for primary school students |
| Article 6 | (Marttinen et al., 2020) | Girls' body image-based curriculum in after-school programs |
| Article 7 | (Merwe et al., 2023) | South African physical education (PE) curriculum on visual-motor integration (VMI), visual perception (VP), and motor coordination (MC) of children |
| Article 8 | (Simonton & Shiver, 2021). | PE Teaching Personal and Social Responsibility (TPSR) curriculum |
| Article 9 | (Kovač et al., 2020). | Implementation of the gymnastics curriculum in the first three-year cycle of primary school |
| Article 10 | (Chen et al., 2021) | Students' motivational response to the Science, PE, & Me! (SPEM) curriculum |
| Article 11 | (Webber & Hardwell, 2019) | Outdoor and Adventurous Activities (OAA) in the physical education (PE) curriculum in primary education |
| Article 12 | (Williams et al., 2022). | Teachers' experiences in teaching the Australian Health and Physical Education (AC: HPE) Curriculum with a focus on the Health Benefits of Physical Activity (HBPA) |
| Article 13 | (Muhtar & Dallyono, 2020) | Character education in physical education curriculum in primary schools |
| Article 14 | (Otero-Saborido et al., 2021). | Assessment in the Spanish Primary Education Physical Education (PE) curriculum |
| Article 15 | (Duncan et al., 2020) | Fundamental motor skills (FMS) in children at Key Stage 1 and 2 in the English school curriculum |
| Article 16 | (Andrade et al., 2020) | Integrating biomechanical concepts into PE using meaningful learning theory |
| Article 17 | (Cebolla-Baldoví & García-Raga, 2021) | Teaching model for managing conflicts in PE classes using sports games among primary school students |
| Article 18 | (Neves, 2019) | Models of PE teaching in Portuguese elementary schools from school managers perceptions |
| Article 19 | (Encinas et al., 2021) | The promotion and teaching of deep and visible thinking skills in primary education PE classes |
| Article 20 | (Rodríguez-Briceño et al., 2022) | Evaluates motor competence in Chilean primary school students: comparing their performance to curriculum expectations |

Table 2.
Articles Data Based on Research Methods

| Article Number | Author(s) and Year | Research Approach | Research Design |
|---|---|---|---|
| Article 1 | (Chick et al., 2022) | Quantitative | Observational cohort prospective design involving 115 primary school students, Data collections: Polysomnography (PSG), Surveys |
| Article 2 | (Davies et al., 2023) | Quantitative | Multidimensional Motivational Climate Observation System (MMCOS) from 44 primary |

Table 2.
Articles Data Based on Research Methods

| Article Number | Author(s) and Year | Research Approach | Research Design |
|---|---|---|---|
| | | | school PE lesson videos, Data collections: Video recordings, MMCOS |
| Article 3 | (Adamčák et al., 2023) | Quantitative | Survey during six months with a purposive sample of 1,300 primary school PE teachers |
| Article 4 | (Oppici et al., 2020) | Quantitative | Randomized controlled trial (RCT), involving 80 primary school students, two experimental groups (high cognitive, low cognitive) and one control group, Data collections: Working Memory Tests, Canadian Agility and Movement Skill Assessment (CAMSA), NIH Toolbox Tests |
| Article 5 | (Marković et al., 2023). | Quantitative | Longitudinal study of six months with 214 grade 3 primary school students, Data collections: Anthropometric Measurements, Eurofit Test Battery |
| Article 6 | (Marttinen et al., 2020) | Qualitative | Case study of 9 girls in grades 5 and 6 primary school, Data collections: journals, field notes, semi-structured interviews, participant artifacts |
| Article 7 | (Merwe et al., 2023) | Quantitative | Randomized controlled trial (RCT) of 44 Grade 1 students who took a pretest and post-test. Intervention of *KaziKidz* toolkit and PE standard curriculum, Data collections: Beery VMI-6, *KaziKidz* toolkit, Fisher's exact test, Kruskal–Wallis test |
| Article 8 | (Simonton & Shiver, 2021). | Quantitative | Comparative design of 2 primary schools on grade 2 and 3 students (n=222). Between traditional PE Curriculum and TPSR Curriculum, Data collection: Questionnaire |
| Article 9 | (Kovač et al., 2020). | Quantitative | Cross-sectional observational study using questionnaires in 90 primary school teachers in Slovenia |
| Article 10 | (Chen et al., 2021) | Quantitative | Cluster randomized controlled trial. sample of students in grades 3, 4, and 5. SPEM group (n=1749; 15 schools) and comparison group (n=1985; 15 schools), Data collections: Situational Interest Scale-Elementary (SIS-E) |
| Article 11 | (Webber & Hardwell, 2019) | Qualitative | Cross-sectional design with semi-structured interviews with 6 primary school teachers, analyzed with interpretivist paradigm and thematic coding process |
| Article 12 | (Williams et al., 2022). | Qualitative | Semi-structured interviews with 15 PE/HPE teachers |
| Article 13 | (Muhtar & Dallyono, 2020) | Qualitative | Case study and content analysis, participants 53 primary school physical education teachers through semi-structured interviews |
| Article 14 | (Otero-Saborido et al., 2021). | Mixed Methods | Document analysis of official regulations in the amount of 3,357 assessment references from 17 Autonomous Communities, Data collection: Documentary analysis |
| Article 15 | (Duncan et al., 2020) | Quantitative | Using the Test of Gross Motor Development-2 (TGMD-2), involving 492 primary school students aged 6-9 years |
| Article 16 | (Andrade et al., 2020) | Mixed Methods | Pedagogical project design. Subjects 17 students grade 5, Data collections: questionnaires, observations, field notes, and audio recordings |
| Article 17 | (Cebolla-Baldoví & García-Raga, 2021) | Mixed Methods | Quasi-experimental, involving 2 schools in Cullera, Participants 130 primary school students (65 in each group), Data collections: observation, interviews, discussion groups, tests, and questionnaires |
| Article 18 | (Neves, 2019) | Qualitative | Exploratory study, Subjects: 14 adjuncts from school management teams across 4 municipalities in the district of Aveiro, Portugal, Data collections: questionnaire, questionnaires, content analysis |
| Article 19 | (Encinas et al., 2021) | Qualitative | Phenomenological design,<br>Subjects: 10 PE teachers primary education,<br>Data collection: Semi-structured interviews |
| Article 20 | (Rodríguez-Briceño et al., 2022) | Quantitative | Cross-sectional design, Participant 377 Chilean students in 3rd and 4th grade of primary school, Data collections: MOBAK 3-4 test |

Table 3.
Articles Data Based on Research Objectives

| Article Number | Author(s) and Year | Research Objectives |
|---|---|---|
| Article 1 | (Chick et al., 2022) | To determine the impact of the health and mindfulness PE curriculum |
| Article 2 | (Davies et al., 2023) | To determine the application of traditional PE curriculum, ecological dynamics, and information processing theory |
| Article 3 | (Adamčák et al., 2023) | How years of teaching practice affect PE teachers' curriculum preferences |
| Article 4 | (Oppici et al., 2020) | To measuring the impact of dance in physical education curriculum |
| Article 5 | (Marković et al., 2023). | Assessing the effectiveness of alternative physical education programs (incorporating dance and gymnastics) compared to the regular PE curriculum |
| Article 6 | (Marttinen et al., 2020) | To exploring the implementation of a girls' body image focused curriculum |
| Article 7 | (Merwe et al., 2023) | To determining the effects of a *KaziKidz* toolkit PE intervention aligned to the South African curriculum on grade 1 students VMI, VP and MC |
| Article 8 | (Simonton & Shiver, 2021). | To compare the outcomes of students receiving the traditional PE curriculum and the TPSR curriculum. |
| Article 9 | (Kovač et al., 2020). | To determine teacher adherence and perceptions of gymnastics curriculum content in physical education |
| Article 10 | (Chen et al., 2021) | To determine students' motivational responses to the SPEM curriculum using situational interest theory |
| Article 11 | (Webber & Hardwell, 2019) | To understanding how senior teachers interpret and value the OAA component of the national PE curriculum |
| Article 12 | (Williams et al., 2022). | To understanding how teachers teach the HBPA focus areas in the curriculum of AC: HPE |
| Article 13 | (Muhtar & Dallyono, 2020) | To explore teachers' views on character education in the physical education curriculum |
| Article 14 | (Otero-Saborido et al., 2021). | To analyze the assessment aspects of PJ for Primary Education in the Spanish curriculum |
| Article 15 | (Duncan et al., 2020) | To measuring the level of mastery of Fundamental motor skills (FMS) in 6-9 years old students in the English Physical Education Curriculum |
| Article 16 | (Andrade et al., 2020) | To analyze integrate biomechanical concepts into the PE curriculum through meaningful learning |
| Article 17 | (Cebolla-Baldoví & García-Raga, 2021) | To design and implement a PE curriculum that improves coexistence by teaching students to manage conflicts and promoting social skills |

Table 3.
Articles Data Based on Research Objectives

| Article Number | Author(s) and Year | Research Objectives |
|---|---|---|
| Article 18 | (Neves, 2019) | To analyze the teaching models of PE in elementary schools, focusing on their implications for curriculum development and sustainability |
| Article 19 | (Encinas et al., 2021) | To explore teachers' perceptions on integrating deep and visible thinking skills into the PE curriculum in primary education |
| Article 20 | (Rodríguez-Briceño et al., 2022) | To assess the motor competence of Chilean primary school students and compare their performance to the expected learning outcomes specified in the PE curriculum |

Table 4.
Articles Data Based on Research Results

| Article Number | Author(s) and Year | Research Results |
|---|---|---|
| Article 1 | (Chick et al., 2022) | The integration of health and mindfulness curriculum within physical education significantly improves students' sleep quality |
| Article 2 | (Davies et al., 2023) | An ecological approach fosters a more supportive motivational climate compared to information processing and traditional approaches |
| Article 3 | (Adamčák et al., 2023) | There are noticeable differences in curriculum preferences between PE teachers with varying pedagogical experiences |
| Article 4 | (Oppici et al., 2020) | Integrating dance exercises combined with high cognitive challenges into the PE curriculum enhances memory capacity and motor skills competence |
| Article 5 | (Marković et al., 2023). | No significant differences were found between alternative and regular PE curriculum regarding motor skills and physical health education |
| Article 6 | (Marttinen et al., 2020) | A body-focused curriculum with an activist approach increases self-confidence and safety among girls |
| Article 7 | (Merwe et al., 2023) | The *KaziKidz* toolkit PE intervention, which includes perceptual motor aspects, significantly enhances Visual-Motor Integration (VMI) and Visual Perception (VP) skills in children |
| Article 8 | (Simonton & Shiver, 2021). | The implementation of the TPSR curriculum led to higher reported levels of enjoyment and responsible behavior among students |
| Article 9 | (Kovač et al., 2020). | Teachers allocate less time to gymnastics, considering it difficult to teach and of moderate importance |
| Article 10 | (Chen et al., 2021) | The SPEM curriculum creates a more situationally engaging learning context for students |
| Article 11 | (Webber & Hardwell, 2019) | Outdoor activities are highly valued despite the lack of guidance in the curriculum, leading to varying interpretations and implementation challenges |
| Article 12 | (Williams et al., 2022). | Teachers tend to focus on individual fitness and fitness testing in HBPA education, with less attention given to social and emotional health aspects |
| Article 13 | (Muhtar & Dallyono, 2020) | Character education is influenced by family, school, and social environment. The current curriculum does not fully support character education development, although physical education is deemed effective in promoting it |
| Article 14 | (Otero-Saborido et al., 2021). | Cognitive dimension assessments (39.42%) dominate in assessment references compared to motor (30.94%) and socio-affective (29.65%) dimensions. Only 11.70% of assessment references integrate all three dimensions |
| Article 15 | (Duncan et al., 2020) | Boys showed higher total FMS scores than girls, with FMS scores increasing as grade levels advance |
| Article 16 | (Andrade et al., 2020) | Enhanced students' comprehension, contributing significantly to the curriculum's development |
| Article 17 | (Cebolla-Baldoví & García-Raga, 2021) | Improved students' ability to manage conflicts, reduce verbal and physical aggression, and foster a collaborative environment |
| Article 18 | (Neves, 2019) | A diversity of PE teaching models in elementary schools, with inconsistent curriculum implementation, often influenced by local management decisions rather than pedagogical foundations |
| Article 19 | (Encinas et al., 2021) | While teachers see the value in integrating thinking skills within the PE curriculum, the emphasis often remains on motor activities due to negative perceptions, lack of training, and teacher insecurity |
| Article 20 | (Rodríguez-Briceño et al., 2022) | Many 3rd and 4th grade students do not meet the motor skill objectives in the curriculum, indicating a need for improved focus on motor skill development in PE. |

Below is the selected publication data that outlines the production output by institution and country, citation trends by year, as well as the most representative journals in the field of implementation PE curriculum primary school. This data forms the basis for further analysis of the research impact and collaboration patterns.

Table 5.
Publications Data: Production by Institution, Country, Journal, and Citation Trends

| Article Number | Author(s) and Year | Institution | Country | Journal | Cites |
|---|---|---|---|---|---|
| Article 1 | (Chick et al., 2022) | Stanford University School of Medicine | United States | Journal of Clinical Sleep Medicine | 6 |
| Article 2 | (Davies et al., 2023) | Liverpool John Moores University, Coventry University, University of Strathclyde, Sheffield Hallam University, Norwegian School of Sport Sciences | United Kingdom, Norway | Physical Education and Sport Pedagogy | 4 |
| Article 3 | (Adamčák et al., 2023) | Matej Bel University | Slovakia | Health, Sport, Rehabilitation | 0 |
| Article 4 | (Oppici et al., 2020) | Victoria University, Technische Universität Dresden, Liverpool John Moores University | Australia, Germany, United Kingdom | Psychology of Sport and Exercise | 20 |
| Article 5 | (Marković et al., 2023). | University of Kragujevac, University of Niš, State University of Novi Pazar, University of East Sarajevo, Aristotle University of Thessaloniki | Serbia, Bosnia and Herzegovina, Greece | Children | 0 |
| Article 6 | (Marttinen et al., 2020) | George Mason University, Baylor University, University of South Florida, California State University | United States | Physical Education and Sport Pedagogy | 8 |
| Article 7 | (Merwe et al., 2023) | University of the Free State | South Africa | South African Journal of Childhood Education | 0 |
| Article 8 | (Simonton & Shiver, 2021). | University of Memphis, Northern Illinois University | United States | European Physical Education Review | 11 |

Table 5.
Publications Data: Production by Institution, Country, Journal, and Citation Trends

| Article Number | Author(s) and Year | Institution | Country | Journal | Cites |
|---|---|---|---|---|---|
| Article 9 | (Kovač et al., 2020). | University of Ljubljana | Slovenia | Science of Gymnastics Journal | 2 |
| Article 10 | (Chen et al., 2021) | Louisiana State University, University of South Florida, Old Dominion University, University of North Carolina | United States | Journal of Sport and Health Science | 6 |
| Article 11 | (Webber & Hardwell, 2019) | Leeds Beckett University | United Kingdom | Sports | 1 |
| Article 12 | (Williams et al., 2022). | University of Canberra, University of Southern Queensland | Australia | Curriculum Perspectives | 4 |
| Article 13 | (Muhtar & Dallyono, 2020) | Universitas Pendidikan Indonesia | Indonesia | Cakrawala Pendidikan | 14 |
| Article 14 | (Otero-Saborido et al., 2021). | Pablo Olavide University | Spain | Cultura, Ciencia y Deporte | 0 |
| Article 15 | (Duncan et al., 2020) | Universitas Coventry | United Kingdom | European Physical Education Review | 38 |
| Article 16 | (Andrade et al., 2020) | Centro Universitário Padre Anchieta, Universidade São Judas Tadeu | Brazil | Cuadernos de Psicologia del Deporte | 0 |
| Article 17 | (Cebolla-Baldoví & García-Raga, 2021) | University of Valencia | Spain | Retos | 3 |
| Article 18 | (Neves, 2019) | Universidade de Aveiro | Portugal | Retos | 2 |
| Article 19 | (Encinas et al., 2021) | Universidad de Valladolid | Spain | Retos | 5 |
| Article 20 | (Rodríguez-Briceño et al., 2022) | Universidad de La Frontera, Universidad de Magallanes | Chile | Retos | 5 |

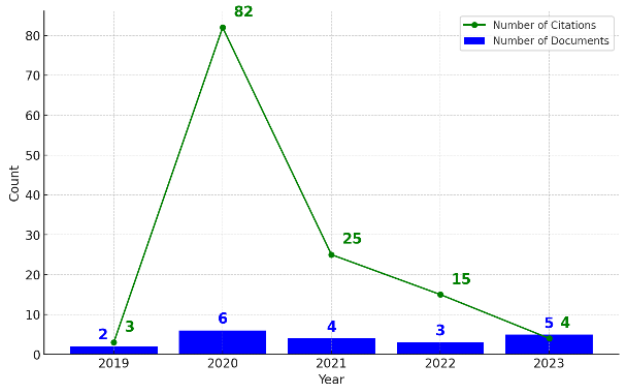


Figure 2. Documents Count and Citations Trends from 2019 to 2023

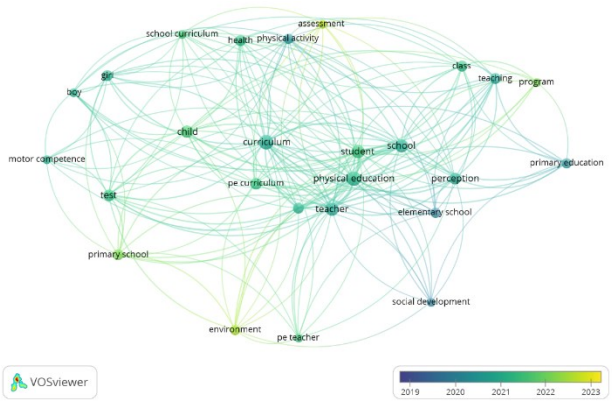


Figure 3. Keyword Network Visualization of PE Curriculum Implementation in Primary Schools

The publication with the highest citation count is 82 citations from 6 documents in 2020. The article with the highest citation count is 38 citations *Article 15* authored by Duncan et al. in 2020, published in the *European Journal of Physical Education*, affiliated with Coventry University, United Kingdom. *Retos* journal is the most frequently referenced source in this literature study, with a total of 4 articles selected. This indicates that Retos plays a significant role in the field of PE curriculum in primary schools. The *United States* is the most represented country in this literature study, with 4 documents focused on PE curriculum in primary schools.

In order to better understand the relationships and key themes within the research on the implementation of PE curriculum in primary schools, a network visualization was generated using VOSviewer. This visualization maps the connections between the most frequently occurring keywords in the literature, highlighting the central topics and their interrelations. The following Figure 3. illustrates the network of terms related to physical education, curriculum implementation, and student outcomes, providing a comprehensive overview of the research landscape.

Based on the results from the VOSviewer visualization illustrates the bibliometric network related to the implementation of the physical education curriculum in primary schools. Central terms such as "curriculum," "teacher," "student," and "physical education" are prominently featured, reflecting their core roles in the implementation process. The visualization reveals strong connections between these terms, indicating that curriculum content, teaching strategies, and student engagement are closely linked in physical education. Clusters related to "primary school," "PE curriculum," and "PE teacher" highlight focused research areas on how the curriculum is applied within the primary school environment. The presence of terms like "assessment," "health physical activity," and "social development" points to the broader impact of the physical education curriculum, encompassing both cognitive and social aspects of student development. The timeline color gradient from 2019 to 2023 shows that topics like "environment," "assessment," and "health physical activity" have gained prominence in recent years, as indicated by the lighter colors. This suggests an increasing focus on how environmental factors and health considerations are being integrated into physical education curricula.

## Discussion

### *Research contents*

The physical education curriculum at the primary school level plays a crucial role in shaping the physical health and psychosocial well-being of students. Various types of primary school physical education curricula have been integrated or modified in research, including: a health and mindfulness-based curriculum (Chick et al., 2022), a motor learning physical education curriculum through ecological dynamics and information processing (Davies et al., 2023), a physical education curriculum incorporating dance (Oppici et al., 2020), alternative physical education programs (dance and gymnastics) (Marković et al., 2023), a physical education curriculum focused on body image for girls (Marttinen et al., 2020), South African physical education curriculum with the *Kazi-Kidz* toolkit (Merwe et al., 2023), the Teaching Personal and Social Responsibility (TPSR) curriculum (Simonton & Shiver, 2021), the Science, PE, & Me! (SPEM) curriculum (Chen et al., 2021), and the UK physical education curriculum focusing on fundamental motor skills (FMS) (Duncan et al., 2020).

Additionally, research has explored the integration of biomechanical concepts into PE using meaningful learning theory (Andrade et al., 2020), teaching models for managing conflicts in PE classes using sports games among primary school students (Cebolla-Baldoví & García-Raga, 2021), and various models of PE teaching in Portuguese elementary schools from the perspective of school managers (Neves, 2019). Moreover, studies have examined the promotion and teaching of deep and visible thinking skills in primary education PE classes (Encinas et al., 2021) and the evaluation of motor competence in Chilean primary school students by comparing their performance to curriculum expectations (Rodríguez-Briceño et al., 2022).

The content of the research also includes teacher preferences, experiences, and perceptions regarding the implementation of primary school physical education curricula, such as: the impact of years of experience on the selection of physical education content (Adamčák et al., 2023), opinions on Outdoor and Adventurous Activities (OAA) in the physical education curriculum (Webber & Hardwell, 2019), teachers' perceptions of gymnastics content in the curriculum (Kovač et al., 2020), teaching experiences with the Australian Curriculum: Health and Physical Education (AC: HPE) and the Health Benefits of Physical Activity (HBPA) (Williams et al., 2022), perceptions of character education (Muhtar & Dallyono, 2020), and assessment in the physical education curriculum (Otero-Saborido et al., 2021). Studies have shown that the effective implementation of primary school physical education curricula can provide significant benefits for students' physical, cognitive, and emotional development. These findings underscore the importance of an inclusive and responsive approach to meeting students' needs.

### *Research methods and types*

Various research methods have been employed to analyze the implementation of primary school physical education curricula. These approaches include quantitative, qualitative, and mixed methods (combining both quantitative and qualitative approaches). The quantitative methods encompass: prospective cohort observational design with longitudinal assessment (Chick et al., 2022), randomized controlled trials (RCT) (Davies et al., 2023; Merwe et al., 2023; Oppici et al., 2020), purposive sample surveys (Adamčák et al., 2023), six-month longitudinal pre-post intervention studies (Marković et al., 2023), comparative designs (Simonton & Shiver, 2021), cross-sectional observational studies (Kovač et al., 2020; Rodríguez-Briceño et al., 2022), cluster randomized controlled trials (Chen et al., 2021), and the Gross Motor Development Test-2 (TGMD-2) (Duncan et al., 2020). Qualitative methods include: case studies (Marttinen et al., 2020), interpretivist paradigms (Webber & Hardwell, 2019), figurational sociology approaches (Williams et al., 2022), case study with content analysis (Muhtar & Dallyono, 2020), exploratory study (Neves, 2019), and phenomenological design (Encinas et al., 2021). The mixed methods approach is exemplified by document analysis (Otero-Saborido et al., 2021), pedagogical project designs (Andrade et al., 2020), as well as quasi-experimental studies combining quantitative approaches (with qualitative techniques (Cebolla-Baldoví & García-Raga, 2021). This diversity of research methods reflects the comprehensive approach needed to evaluate various aspects of the primary school physical education curriculum, ranging from intervention effectiveness to teacher preferences and student responses.

### *Research objectives and results*

Research on primary school physical education curricula encompasses a variety of objectives, including evaluating the impact of interventions, exploring teacher preferences, and analyzing program effectiveness. Studies focusing on intervention outcomes and student responses have yielded several insights. For example, the health and mindfulness curriculum has been found to improve sleep duration and quality in children (Chick et al., 2022). Similarly, a physical education curriculum based on ecological dynamics fosters a more supportive motivational climate (Davies et al., 2023). Dance curricula in physical education have been shown to enhance working memory capacity and motor competence in students (Oppici et al., 2020). Both alternative and traditional physical education programs positively impact motor skills and physical health education (Marković et al., 2023). The *KaziKidz* toolkit for physical education significantly improves visual-motor integration and visual perception abilities (Merwe et al., 2023). Furthermore, the TPSR curriculum enhances student responsibility, social skills, and emotional well-being (Simonton & Shiver, 2021). The SPEM curriculum effectively increases students' situational interest in physical education (Chen et al., 2021). A body image-focused curriculum for girls promotes engagement and self-confidence (Marttinen et al., 2020). The English physical education curriculum emphasizes the need for

a greater focus on fundamental movement skills in the early stages of primary education (Duncan et al., 2020). Integrating biomechanical concepts into the PE curriculum through meaningful learning has been shown to enhance students' comprehension, significantly contributing to curriculum development (Andrade et al., 2020). The development and implementation of a PE curriculum aimed at improving coexistence by teaching students to manage conflicts resulted in improved conflict management, reduced verbal and physical aggression, and fostered a collaborative environment (Cebolla-Baldoví & García-Raga, 2021).

From the teachers' perspective, research objectives include examining their perceptions and experiences with different curricula. An exploration of teachers' perceptions regarding the integration of deep and visible thinking skills into the PE curriculum revealed that while teachers see the value, the focus often remains on motor activities due to negative perceptions, lack of training, and teacher insecurity (Encinas et al., 2021). Studies have found that physical education teachers' curriculum preferences vary based on teaching experience, affecting content selection (Adamčák et al., 2023). Gymnastics curriculum implementation is perceived as one of the most challenging and time-consuming to teach (Kovač et al., 2020). Teachers value outdoor and adventure activities (OAA) for their role in developing students' interpersonal skills and resilience on PE curriculum (Webber & Hardwell, 2019). There is a need for a more inclusive understanding of health-based physical activity (HBPA) in the Australian physical education curriculum, which should address students' social and emotional health (Williams et al., 2022). While teachers recognize the effectiveness of physical education curricula in promoting character education, they often express confusion regarding implementation (Muhtar & Dallyono, 2020).

Based on the analysis of program effectiveness, it is essential to understand how the implementation of diverse teaching models and assessment practices influences the consistency and success of physical education curriculum. Research on teaching models in elementary schools highlighted a diversity of PE teaching approaches, though often with inconsistent curriculum implementation influenced more by local management decisions than pedagogical foundations (Neves, 2019). Assessment of motor competence in Chilean primary school students showed that many 3rd and 4th graders do not meet the motor skill objectives outlined in the curriculum, indicating a need for improved focus on motor skill development in PE (Rodríguez-Briceño et al., 2022). Assessment within the Spanish physical education curriculum tends to prioritize theoretical knowledge, often at the expense of comprehensive evaluation (Otero-Saborido et al., 2021). The review of research articles indicates that various interventions and teacher perceptions of primary school physical education curricula significantly benefit the quality of physical education and student development across physical, cognitive, and emotional domains.

***Implications for the PE curriculum***

Based on the review of various research articles, there are significant implications for the design and implementation of the physical education (PE) curriculum in primary schools. The PE curriculum should support the cognitive, emotional, and physical development of children (Chick et al., 2022) and create a positive and empowering learning environment for students (Davies et al., 2023). PE teachers must have the autonomy to select educational content that meets the needs of students and the learning environment (Adamčák et al., 2023). Alternative PE curricula can incorporate cognitive and motor challenges such as dance and gymnastics (Marković et al., 2023; Oppici et al., 2020). A student-centered activist approach in the PE curriculum can provide pedagogical flexibility and build confidence for long-term transformation (Marttinen et al., 2020). A PE curriculum focusing on perceptual-motor skills can benefit students' development (Merwe et al., 2023). Additionally, motivation, emotional experiences, responsibility, interpersonal skills, and resilience should be considered in the primary school PE curriculum (Chen et al., 2021; Simonton & Shiver, 2021; Webber & Hardwell, 2019).

Building on these foundational aspects, the effectiveness of the PE curriculum can be further enhanced by integrating biomechanical concepts and conflict management into PE enhances student understanding, communication, and social skills, contributing to a more effective program (Andrade et al., 2020; Cebolla-Baldoví & García-Raga, 2021). A sustainable approach, incorporating various teaching models, ensures consistent delivery and collaboration among educators (Neves, 2019). Additionally, emphasizing deep thinking skills and motor competence through targeted interventions improves cognitive engagement and helps students meet learning outcomes (Encinas et al., 2021; Rodríguez-Briceño et al., 2022).

Supporting these curricular innovations requires a focus on professional development and training for teachers, particularly in motor skill development at the primary school level. This focus will enable more creative content delivery, teaching methods, and flexible, participatory-comprehensive assessments (Duncan et al., 2020; Kovač et al., 2020; Muhtar & Dallyono, 2020; Otero-Saborido et al., 2021). Finally, there is a need for a more inclusive and comprehensive learning approach that connects physical health with social and emotional well-being in the primary school PE curriculum (Williams et al., 2022). Therefore, the design and implementation of an effective PE curriculum require an inclusive, flexible, and responsive approach to students' needs, as well as adequate training and resources for PE teachers.

## Conclusions

Conclusion of this study emphasize the critical need for a comprehensive approach to designing and implementing physical education curriculum in primary schools. By integrating health, mindfulness, cognitive challenges, biomechanical concepts, and conflict management within the curriculum, it is possible to significantly enhance students'

physical, cognitive, collaborative, and emotional development. The study also highlights the importance of curriculum flexibility, which allows educators to tailor physical education content to local needs and integrate thinking skills and relevant contexts. Moreover, the adoption of gender-responsive strategies and models like Teaching Personal and Social Responsibility (TPSR) has been shown to improve students' psychosocial well-being and social responsibility. The study further underscores the necessity of improved teacher training and the development of more innovative teaching methods to address challenges in implementing specific curriculum components, such as dance and gymnastics. An effective physical education curriculum should be comprehensive, adaptable, and consistently implemented, with a strong focus on motor skill development and the holistic growth of students. These insights are invaluable for curriculum developers, educators, and policymakers in creating physical education programs that not only enhance students' physical health and cognitive abilities but also promote mental well-being and social-emotional development, ultimately fostering well-rounded individuals with strong character.

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**Conflict of interests**

There is no conflict of interest.

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