










REVIEW

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Mapping recommended strategies to promote active and healthy lifestyles through physical education classes: a scoping review

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Abstract

Background: Understanding which strategies have been recommended for the promotion of active and healthy lifestyles through physical education (PE) classes can guide PE policies and practice. Therefore, we summarized world-wide recommendations regarding strategies for PE classes that have aimed to promote active and healthy lifestyles among school-aged children and adolescents.

Methods: The Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) guidelines were utilized. A literature search was carried out in June 2020 in eight peer-reviewed literature databases, in addition to searches in institutional and personal libraries. The eligibility criteria included any online document that included recommendations targeting any dimension of PE classes (e.g., policy and environment, curriculum, appropriate instruction, student assessment, and strategies that interact with PE) published since 2000.

Results: In total, 2,408 potentially eligible documents were screened. Of these, 63 were included in the final analysis. The recommended strategies were as follows: six referred to policy and environment (valuing PE, higher frequency and duration of classes, inclusive PE classes, mandatory daily classes, evaluation of PE classes, and qualified teachers), five to curriculum (structure, type of content, cross-cutting themes, and components that improve PE classes), four to appropriate instruction (promotion of physical activities, inclusion of social issues, employment of the use of innovative technologies, and organization of the teaching–learning process), and three to student assessment (understanding human movement concepts, evaluation of contents, and assessment methods to develop an active and healthy lifestyle).

Conclusion: Twenty-one strategies recommended for PE classes linked to five dimensions aimed at different target populations were identified. Over half were linked to the dimensions of policy and environment and appropriate instruction. PE is recommended to be mandatory and valued at all educational levels, with weekly frequency that contributes to an active and healthy lifestyle. This review shows that guaranteeing different experiences beyond

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sports, improving social inclusion, using innovative technologies, and providing adequate materials and spaces to be important challenges and ways to guide policies, programs, and new research in this field of knowledge.

Open Science Framework Registration: <https://osf.io/harwq/>

Keywords: School, Physical education, Strategies, Physical activity, Health

Introduction

Physical education (PE) is a curricular component in schools that offers students the opportunity to acquire PE-related knowledge and skills contributing to integral human development [1]. Broad and properly oriented PE classes contribute to students developing their physical literacy, which is defined as holistic learning involving motor/physical [2], psychological/cognitive (e.g., self-esteem and lower levels of anxiety) [3], and social skills (e.g., cooperation, proactivity, and establishment of friendships) [4] obtained through life, applied in movement and physical activity contexts [5]. PE also contributes to expanding the cultural experience and political values (ethical, aesthetic) for a critical training of students [6]. Moreover, quality PE may help people engage in physical activity during the school phase of one's life and beyond, allowing them to apply the skills obtained through PE classes [7].

At the same time, there are important challenges worldwide in ensuring the right to PE classes. Data from the Global School-Based Student Health Survey, a population-based survey developed with the assistance of the World Health Organization and Centers for Disease Control and Prevention, that involved 206,417 adolescents from 65 countries showed that two out of ten students were not enrolled in PE classes, and only 25% of students were enrolled in three or more PE classes weekly [8]. The last United Nations Educational, Scientific and Cultural Organization global survey on PE conducted in 2013 included data from 232 countries/autonomous regions worldwide and reinforced that 97% of countries have legal requirements for PE classes at some age/stage or phase of compulsory schooling, but only 71% of countries adhered to implementation in accordance with legal/mandatory obligations or expectations [9].

In addition to the quantity of PE classes, there is a need to consider the quality of PE, which might be addressed by investigating the successful implementation strategies to reveal the main elements (for policy–practice purposes) and strategies directed to stakeholders for this transformation setting (i.e., policymakers, stakeholders, teachers, students, and families). In other words, there is a need to understand how, when, where, and how much PE can help students' and society's health, education, and development [10, 11]. Government and non-government institutions have recommended several strategies

for guiding public policy decisions and practice for PE classes, aiming to improve the active and healthy lifestyles of students [10, 12]. These strategies can be related to (i) the recognition and structure involved in the discipline (i.e., policy and environment), (ii) the didactic–pedagogical actions of teachers (i.e., appropriate instruction), (iii) the elaboration of the educational contents and guidelines (i.e., curriculum), and (iv) the evaluation of the development and progress of students (i.e., assessment) [12]. In addition, strategies that interact with PE classes (i.e., health education actions at school) have been recommended for PE to be a promoter element of a health-promoting school [13].

Although the strategies recommended in plans and policies to promote physical activity are known and have been summarized [14, 15], to our knowledge, no study has synthesized which strategies are recommended specifically for PE classes. For policies, summarizing such recommendations can support the elements that stakeholders and politicians may consider for governmental and institutional decisions connected with this discipline. The actors involved in pedagogy (especially teachers and students) can understand the different strategies that improve pedagogical practice and build positive experiences with human movement concepts [16], which are essential for health promotion. By summarizing the information through a scoping review, it is possible to understand the breadth of recommended strategies and the gaps in policy documents, guiding new research on the subject.

Therefore, this study intends to fill research and policy gaps contributing to the improvement of PE classes. The purpose of this systematic scoping review was to summarize worldwide recommendations regarding PE class strategies (policies and environment, appropriate instruction, curriculum, and assessment) aimed at promoting active lifestyles among school-aged children and adolescents. We sought to answer the following research question: What strategies for PE classes have been recommended worldwide to promote active lifestyles among school-aged children and adolescents?

Methods

Protocol and registration

To answer our research question, a scoping review was conducted, providing an overview of the literature on our

topic of interest (promoting active lifestyles through PE), indicating the extent of the studies available, key characteristics, emerging evidence, and research gaps, with the aim of contributing to research and policy agendas [17]. For this review, we used the PRISMA-ScR (PRISMA extension for Scoping Reviews, Supplementary Material 1) checklist [17] (Fig. 1). The protocol was registered in the Open Science Framework (<https://osf.io/harwq/>).

Eligibility criteria

This scoping review involved the following steps: 1) identifying the research question, 2) identifying the

relevant studies, 3) selecting the studies, 4) extracting the data, and 5) summarizing and reporting the findings. The guiding question was “What strategies related to PE classes have been recommended to promote active lifestyles in students?”

The eligibility criteria for documents were organized into four groups, considering the recommended mnemonic (Population, Concept, and Context) for research questions of scoping reviews [18] and with the inclusion of the type of publication (Table 1).

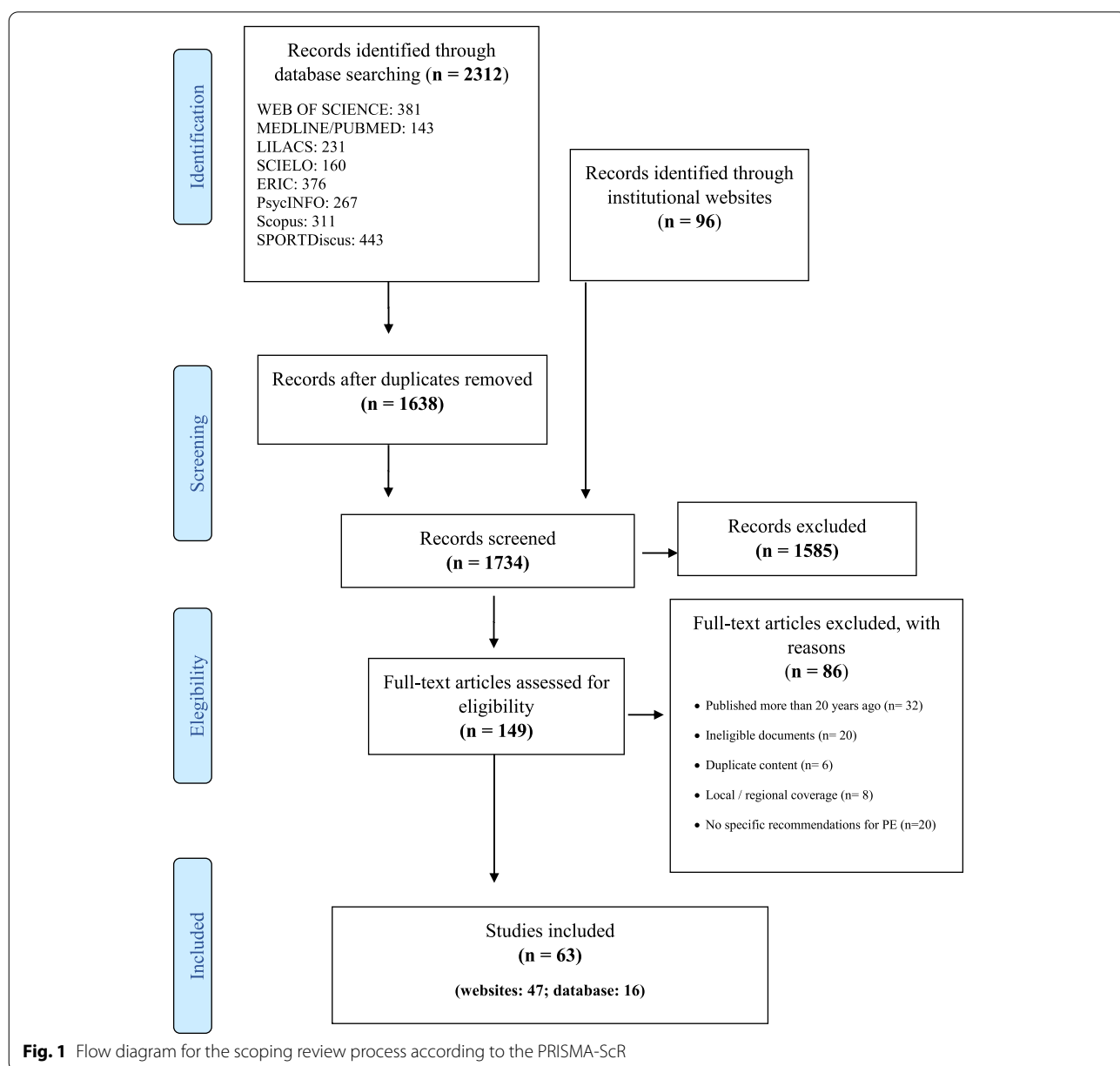


Fig. 1 Flow diagram for the scoping review process according to the PRISMA-ScR

Table 1 Eligibility criteria for the scoping review

Elements	Eligibility criteria
Type of publications	Guidelines, positions, plans, handbooks, or other documents; documents published by organized civil societies, professional organizations, governmental or non-governmental and non-profit organizations with national or international scope; documents published since 2000 until the date of research; and documents in Portuguese, English or Spanish were considered eligible. For documents that were updates of a previous document, only the last version was considered eligible
Population	Documents directed at school-age kids from elementary to high school were considered eligible. The Brazilian grades for kindergarten, elementary, middle and high school were based on the National Curriculum Guidelines [19]. Documents that addressed specific teaching modalities for target populations were not included (e.g., Indians, rural education, and special education for children with physical or intellectual disabilities)
Concept	Strategies were analyzed based on the four essential components of PE used by SHAPE [12], in addition to a fifth dimension elaborated by our group, as follows: 1) Policy and environment – related to changes in the number of weekly classes, class duration, size, time, spaces, equipment, and pedagogical structure as well as school rules regarding PE exemptions, substitutions, or punishments 2) Curriculum – focused on curricular plans and standards, such as the content, units, lessons, and activities to be taught during PE 3) Appropriate instruction – related to the use of instructional practices provided by the physical educator that encourage teacher and student involvement, participation and inclusion, and the use of materials, equipment, and technologies to promote maximum physical activity during classes 4) Student assessment – related to the measurement and monitoring of what students learn during PE; 5) Other practices related to PE – related to the actions that occur beyond the PE classes, but are intrinsically linked to the promotion and development of students' physically active and healthy lifestyle
Context	This review included documents that presented any recommendation for the promotion of a physically active and healthy lifestyle through PE classes. Documents with recommendations that reported multi-component strategies related to PE, that is, in addition to PE classes, were also included. Documents that included high-performance sports were not considered

Information sources

For our document search, we used three approaches that included peer-reviewed literature databases, searches in institutional websites, and personal libraries. For peer-reviewed literature, the search was carried out on June 4, 2020, in eight scholarly databases/repositories: Web of Science, MEDLINE/PubMed, LILACS, SCIELO, ERIC ProQuest, PsycINFO, Scopus, and SPORTDiscus. Second, electronic database searches were complemented by a search on websites of 27 national and international institutions that have contributed or contribute to PE in national or international contexts, referring to different regions of the world. The websites were accessed in June 2020 (see Supplementary Material 2). In addition, the reference lists of the included studies and recent publications were examined to identify potential studies that could also be included in the review.

Search

The search terms were obtained and refined by consulting relevant publications connected with the topic of interest of this study. The search was structured using free text and Medical Subject Headings (MESH) terms. The strategy was based on the most relevant elements of the study problem (i.e., PE, school, physical activity and its related outcomes, health, and education) and the type of publication (i.e., reviews and recommendations; see Supplementary Material 3). The terms were combined using Boolean operators (OR, AND, and AND NOT)

and truncation symbols. The search strategies followed the recommendations of a past peer review of electronic search strategies [20].

Selection of sources of evidence

The titles of the selected references from the searched databases were imported into an EndNote library. Duplicate works were excluded using a reference manager. The library, which contained all potentially eligible titles, was worked on separately by two reviewers (AB and FR) with experience in systematic reviews. The selection process comprised two phases: 1) title and abstract reading and 2) full text reading. In both phases, a consensus meeting was held to discuss potentially eligible studies that met the study inclusion criteria (Table 1). In case of discrepancies between the reviewers, a third reviewer (VBF) was consulted for a decision.

One reviewer (VBF) searched for potential websites to conduct a document search. The potentially eligible documents were organized in a datasheet and analyzed by two reviewers (AB and FR) before being included in the final review.

Data charting process and data items

Data was extracted by two independent reviewers (AB or FR). Each reviewer was responsible for half of the selected documents and the complete extraction was revised by another (VBF). In addition, discrepancies between reviewers were resolved through consensus

meetings. A standardized excel spreadsheet was created and included the following data: the name of the institution involved, the document's geographical coverage, the year the document was published, the document's goals and description, the target population (school administrators, principals, teachers, parents, and students), the PE dimensions (policy and environment, curriculum, appropriate instruction, assessment, and information on other practices related to PE; see Supplementary Material 4).

Summarizing and reporting the results

After the charting process, the same reviewers summarized the recommendations related to PE aimed at promoting a physically active and healthy lifestyle for students. The following elements were considered: the action carried out (represented by the verb in the infinitive form), the recommended strategy (the object of PE or its contribution to health), the context (targeted audience), and the PE dimensions involved (policy and environment, curriculum, appropriate instruction, assessment, and other practices related to PE). After the recommendations were compiled into the five PE dimensions, a further analysis was performed to regroup recommendations that shared similarities (e.g., 11 recommendations addressed the need to provide and support PE classes with the same rigor as other subjects). This process was discussed by four reviewers (AB, FR, and VBF or KSS) through three consensus meetings (on saturation). Lastly, another two meetings took place to establish a more comprehensive framework for the recommended strategies to promote physical activity and health in PE in each domain (Figs. 2, 3, 4, 5, and 6).

Results

Selection of sources of evidence

The electronic search of databases (2,312 titles) and institutional websites (96 titles) identified 2,408 potentially eligible documents, which was reduced to 1,638 after excluding duplicates. In the process of selecting titles and abstracts, 149 documents presented recommendations on strategies for PE. Of these, 86 were excluded because they were published before 2000 ($n=32$), 20 were ineligible (e.g., abstracts), 20 did not present specific recommendations for PE, eight were documents with a local/regional scope, and six duplicated content from other documents. Therefore, 63 documents (47 and 16 from institutional websites and databases, respectively) were included in this review.

Characteristics of sources of evidence

Most of the documents reviewed were published from 2011 to 2015 (34.9%) and from 2016 to 2020 (36.5%).

Most were practical guides (42.8%), and most addressed PE classes within a broader scope, such as total physical activity, sport, and/or education (i.e., PE was not a primary focus in 65.1% of documents). Regarding the geographic scope of the institutions involved, 27 (47.8%) were national government institutions, and 18 (28.6%) were international or regional (e.g., Europe) institutions. In general, the documents presented recommendations aimed at more than one target audience, focusing mainly on school managers and politicians, and teachers. Strategies were mainly focused on the dimensions of policy and environment (81.0%) and appropriate instruction (66.7%). Detailed information for each document can be found in Tables 2 and 3.

Synthesis of results

In the initial extraction phase, the following strategies were identified: 112 for policy and environment, 106 for appropriate instruction, 57 that involved interactions with school PE, 40 for curriculum, and 38 for student assessment. After three meetings with experts, strategies were grouped into dimensions and those that addressed more than one thematic in the same dimension (e.g., policy and environment) were repeated. For example, in the first meeting with experts, the extracted strategies were grouped into 24 (policy and environment), 12 (curriculum), 16 (appropriate instruction), 14 (student assessment), and 7 (strategies that interacted with PE) recommendations. In the final meeting, 6 recommended strategies were obtained for policy and environment, 5 for curriculum, 4 for appropriate instruction, 3 for student assessment, and 3 for those that involved interactions with PE. The detailed strategies for each stage are shown in Figs. 2, 3, 4, 5, and 6, and the references for each strategy can be consulted in supplementary material 7.

Policy and environment

Multiple strategies of policy and environment dimension were merged into six recommendations that addressed the following themes (Fig. 2 and supplementary material 7): i) valuing PE, financing, and better working conditions ($n=40$ strategies); ii) higher frequency and duration of PE classes and physical activity at school ($n=61$ strategies); iii) the need for PE classes to be inclusive and never punitive ($n=11$ strategies); iv) mandatory daily PE at all levels of education to promote student health and well-being ($n=15$ strategies); v) the evaluation of the implementation of PE guidelines at school ($n=6$ strategies); and vi) certified, trained, and qualified teachers ($n=16$ strategies).

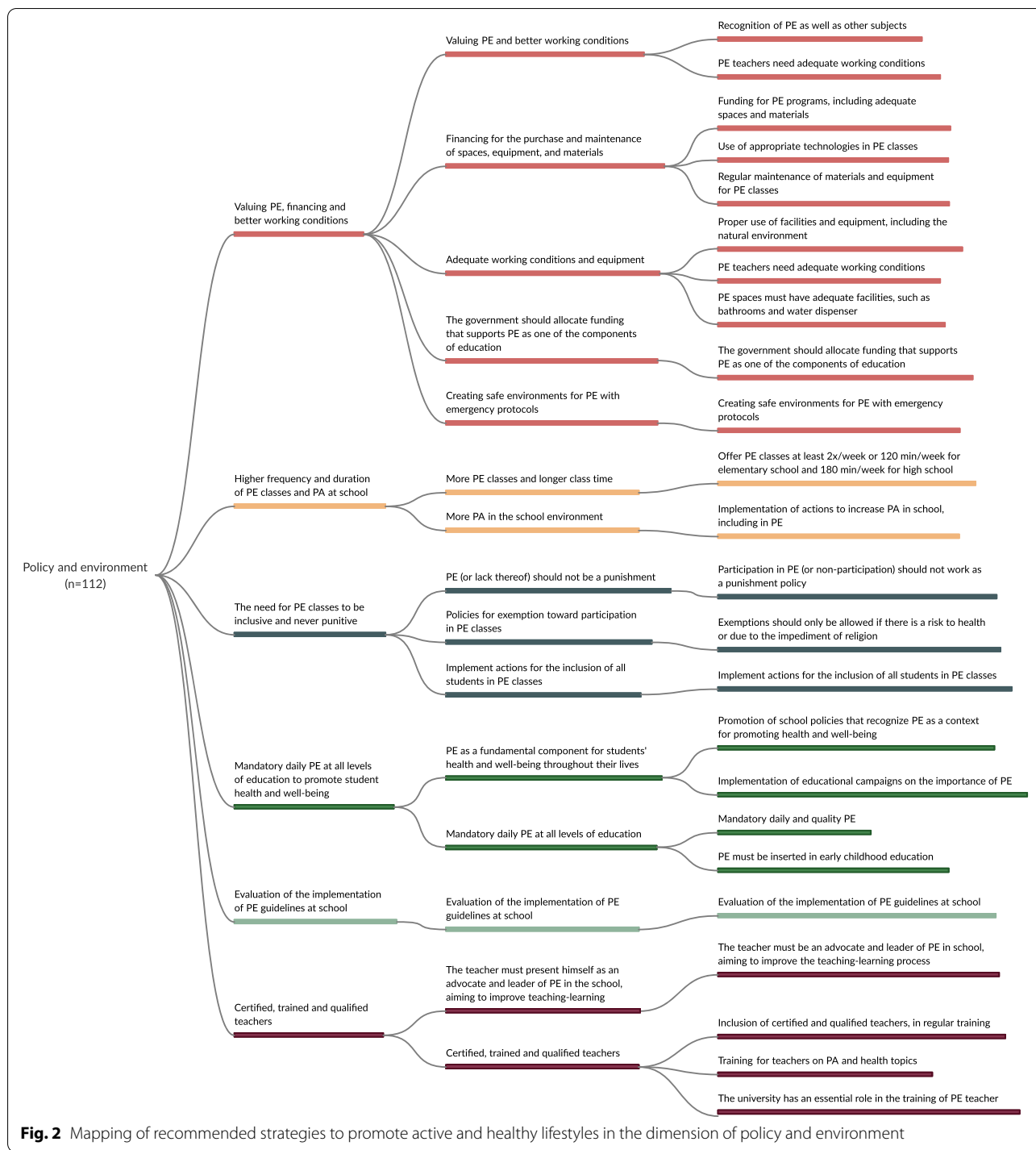


Fig. 2 Mapping of recommended strategies to promote active and healthy lifestyles in the dimension of policy and environment

Curriculum

Five recommendations were identified for the curriculum dimension (Fig. 3 and supplementary material 7): i) the need for the curriculum to follow national, state, and municipal standards with a sequential and progressive structure ($n = 11$ strategies); ii) the need for the

inclusion of movement behavior content that promotes physical, cognitive, and social literacy throughout life ($n = 14$ strategies); iii) the need for the inclusion of cross-cutting themes for PE ($n = 7$ strategies); iv) the need for the inclusion of components that improve classes and school community participation ($n = 8$ strategies); and v)

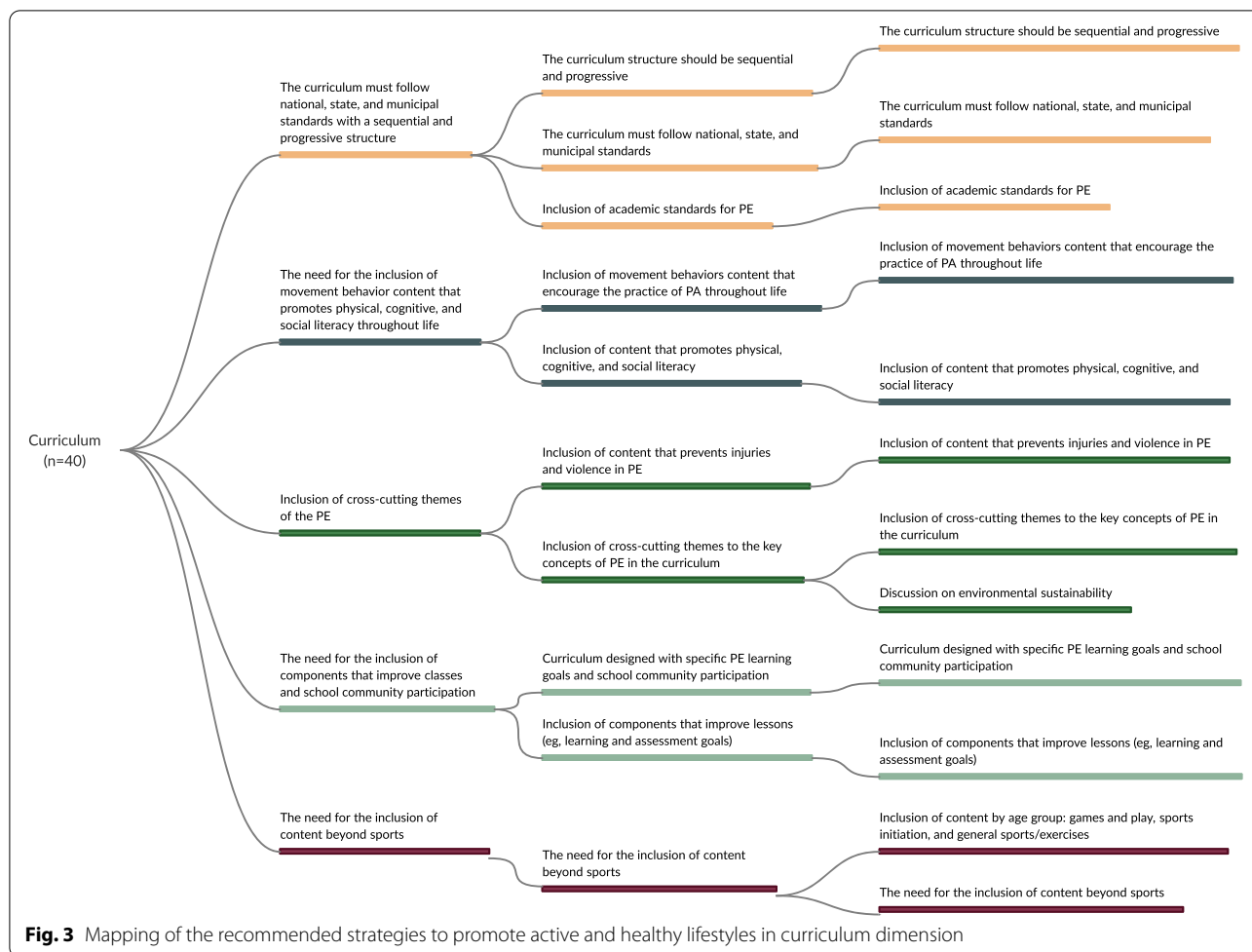


Fig. 3 Mapping of the recommended strategies to promote active and healthy lifestyles in curriculum dimension

the need for the inclusion of content beyond sports ($n=7$ strategies).

Appropriate instruction

For the appropriate instruction dimension, the following recommendations were identified (Fig. 4): i) the need to use strategies to promote physical activity and develop students’ physical literacy, fitness, and social aspects including mental and emotional well-being ($n=39$ strategies); ii) the need to use strategies that discuss important social issues and include all students ($n=43$ strategies); iii) the need to use innovative approaches, technologies, and well-maintained equipment and materials ($n=8$ strategies); and iv) the need to organize the teaching–learning process systematically and present it clearly to the school community ($n=13$ strategies).

Student assessment

The student assessment dimension included three recommendations (Fig. 5): i) the need to understand human movement concepts and achieving an integral

development ($n=8$ strategies); ii) the need to follow identical requirement levels of other disciplines, with evaluations consistent with policy contents and standards ($n=23$ strategies); and iii) the need to diversify assessment methods to develop the active and healthy lifestyles of students and present their progress to the guardians ($n=8$ strategies).

Strategies that interacted with PE

Three recommendations identified for the dimension of strategies that interacted with PE (Fig. 6) included the following: i) PE teachers should act as strategy leaders to promote physical activity in school ($n=10$ strategies); ii) schools must provide physically active environments and encourage family participation ($n=17$ strategies); and iii) action plans supporting an active and healthy lifestyle should be promoted at school, encouraging integration among different subjects ($n=17$ strategies).

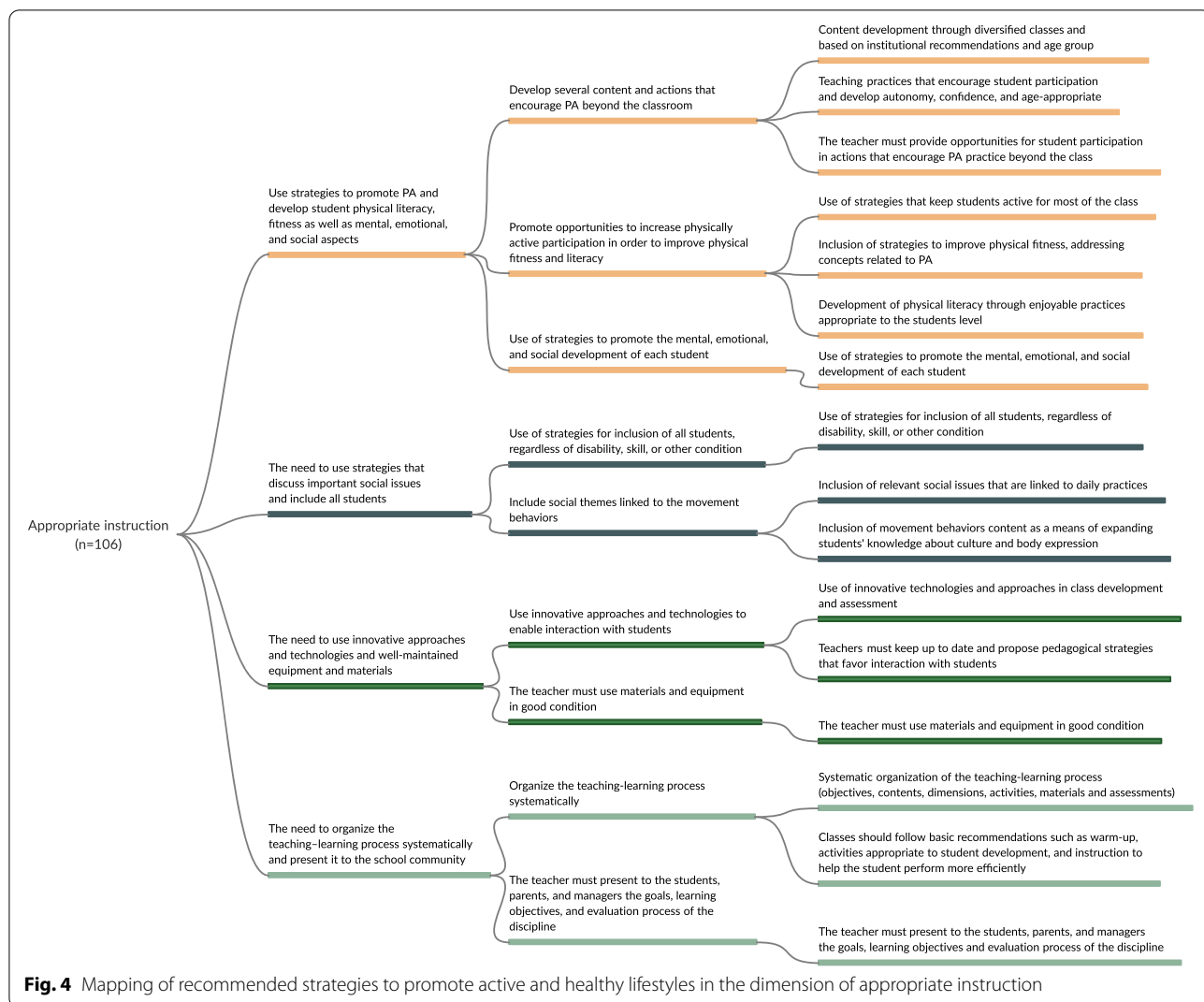


Fig. 4 Mapping of recommended strategies to promote active and healthy lifestyles in the dimension of appropriate instruction

Discussion

This systematic scoping review sought to summarize worldwide recommendations regarding strategies for PE classes that focus on promoting active and healthy lifestyles among children and adolescents. Overall, we summarized the contents of documents into 21 recommendations for PE classes, with 11 focusing on the dimensions of policy and environment and appropriate instruction. Furthermore, we observed that the reviewed publications did not address PE classes as their primary focus. They were also prepared by government and non-government institutions, mainly directed to managers and teachers.

We found that the most identified strategies addressed the policy and environment dimension. Most of them were related to the recommendations for increasing the frequency and duration of PE classes and physical activity at school. It also recognized the importance of PE,

financing, and providing better working conditions. National government institutions have suggested that PE classes should have as much time as possible and be held more times a week [12, 61]. For example, the Society of Health and Physical Educators (SHAPE America) recommends that elementary and middle schools should provide PE at least 150 min/week and 225 min/week, respectively [12, 61]. Moreover, recent systematic reviews have observed that the quantity of PE classes (lessons per week) is associated with improved health outcomes [2] and academic performance [38]. However, additional well-designed studies are needed to clarify the relationship between physical activity and cognitive outcomes, including academic performance [81]. Despite this evidence, a global survey on PE observed that of the 232 countries/autonomous regions analyzed, 97% presented legal requirements for PE classes, but only 71% of countries adhered to implementation in accordance with

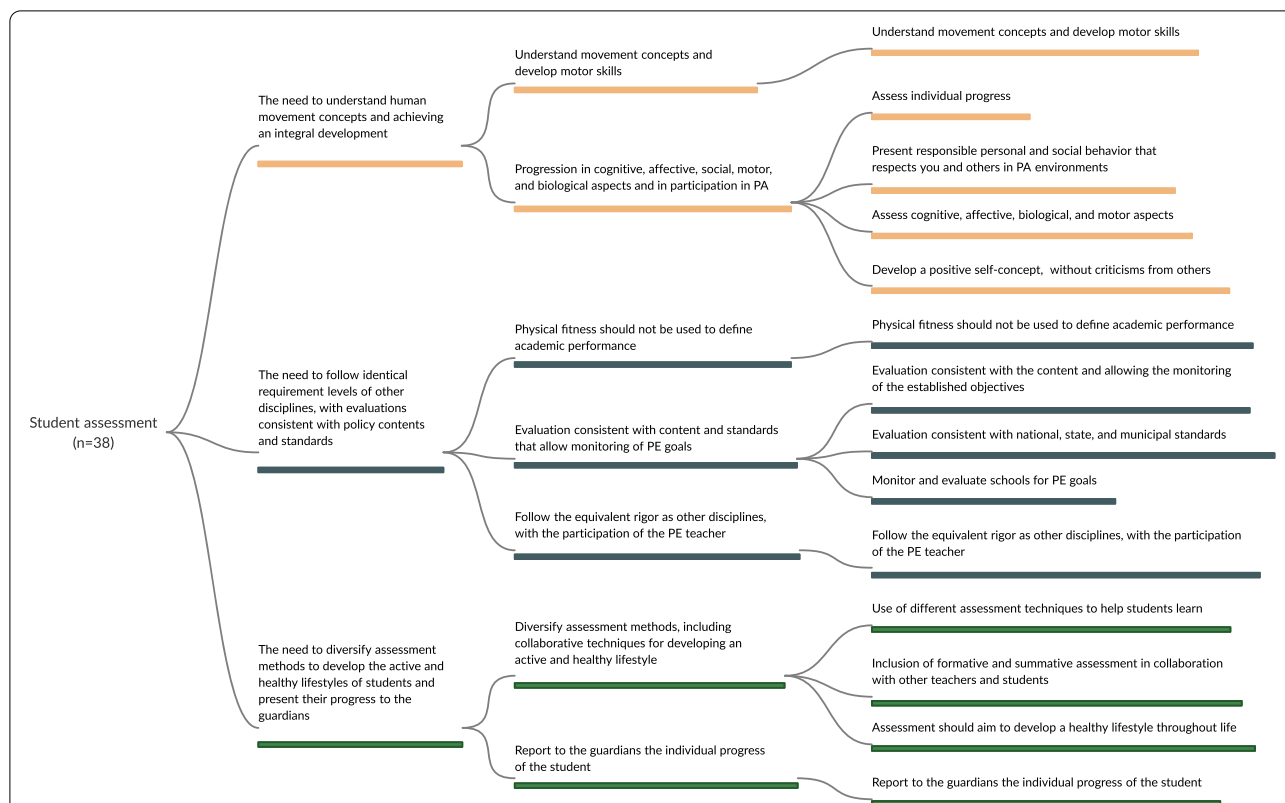


Fig. 5 Mapping of recommended strategies to promote active and healthy lifestyles in the dimension of student assessment

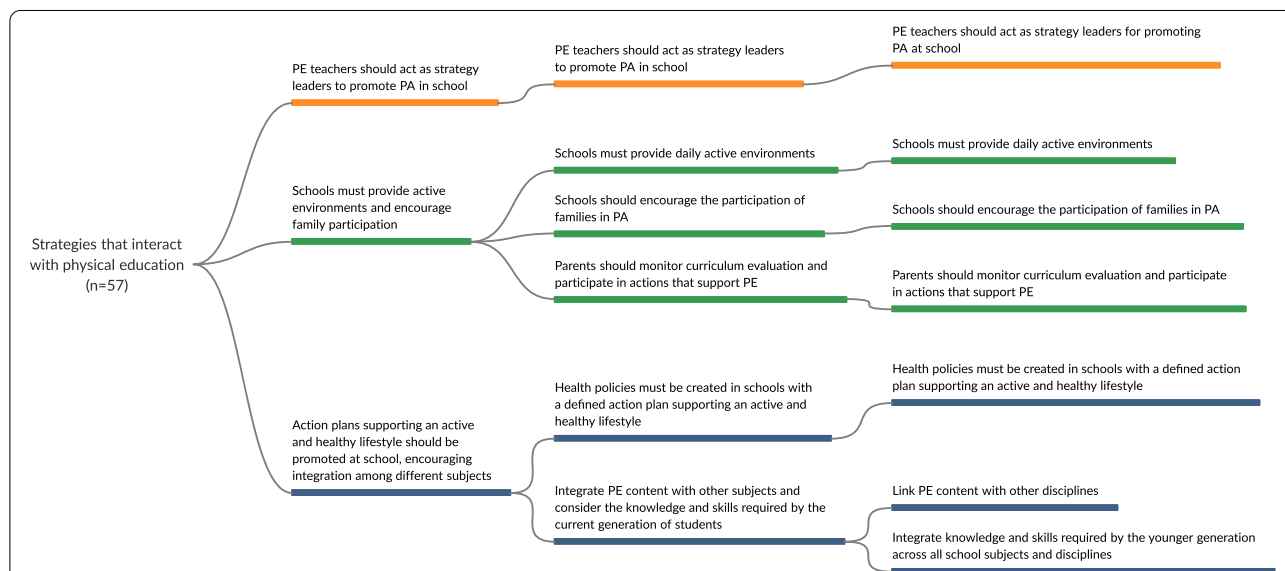


Fig. 6 Mapping of recommended strategies that interact with physical education to promote active and healthy lifestyles

legal/mandatory obligations or expectations [9]. Hence, PE should be valued as a fundamental part of education and health policies since it contributes to students' health, quality of life, and social development [7, 33, 35,

36, 40, 69], as supported by the World Health Organization [7]. Although the inclusion of specialized PE teachers in primary and secondary schools is quite different among the countries (e.g., some countries only have PE

Table 2 Publications and methodological characteristics of included documents ($n = 63$)

Publication/methodological characteristics	n (% of 63 studies)
Year	
2000–2005	6 (9.5)
2006–2010	12 (19.0)
2011–2015	22 (34.9)
2016–2020	23 (36.5)
Geographic scope of the institution/organization	
Governmental, national level	27 (47.8)
Institutional, national level	18 (28.6)
Institutional, international/regional level	13 (20.6)
Institutional, international/global level	5 (7.9)
Type of document	
Practice guide	27 (42.8)
Institutional statement	19 (30.1)
Institutional recommendations	10 (15.9)
Institutional scientific report	7 (11.1)
Is PE primary in the document?	
Yes	22 (34.9)
No	41 (65.1)
Target population ^a	
Students	20 (31.7)
Teachers	47 (74.6)
School managers and politicians	62 (98.4)
Parents/relatives	28 (44.4)
Recommendation dimensions ^a	
Policy and environment	51 (81.0)
Curriculum	29 (46.0)
Appropriate instruction	42 (66.7)
Student assessment	18 (28.6)

^a Some documents provided recommendations for more than one target population and dimension

teachers for secondary schools), our results also highlighted the role of PE teachers in improving the teaching–learning process and, consequently, the importance of including trained, certified, and qualified professionals at schools [36, 46, 50, 79].

The main findings of this study regarding appropriate instruction were the need to use strategies to promote physical activity and physical literacy, i.e., motor, cognitive, emotional, and social competences; and the need for using strategies that discuss important social issues and include all students. It is recommended that teachers should consider enjoyable practices to keep students active, physically and as active learners [11, 21, 29, 34, 36, 41, 51, 52, 56, 60, 65, 78]. A favorable environment for children and adolescents' social, mental, and emotional development should also be provided. In this way, PE through diverse classes can serve as a good tool for developing students' confidence and autonomy,

complementing the practice of physical activities outside school, and contributing to maintaining this behavior throughout life [11, 21, 29, 34, 36, 41, 51, 52, 56, 65, 78]. For this purpose, teachers may consider using innovative technologies and approaches that may contribute to realizing these enjoyable practices [34, 37, 52, 82]. Equipment and materials used in classes also need to be diverse [22, 34, 37, 83], although the lack of adequate equipment and materials is a frequent problem reported in schools in low- and middle-income countries.

Our findings support the importance of national, state, and municipal standards for PE classes, considering a sequential and progressive PE curriculum. Diverse content movement behaviors should be included to promote physical literacy throughout life. Although the importance of following academic standards as established by responsible educational institutions is clear [21, 30, 37, 62, 84], it is common to find PE curricula with not well-established structures without a sequence of content and adequate progression [9]. This may be related to the historical panorama of PE, a discipline that has previously played the main role in improving students' physical fitness and sports performance. This scenario has evolved over the years to meet the needs of the school environment. Currently, in addition to sports, the importance of including content that promotes physical, cognitive, and social competencies has been highlighted to help students with demands that arise in their lives [11, 21, 34, 35, 37, 44, 78, 85]. An example is the inclusion of cross-cutting themes of PE to prevent injuries, bullying, and violence at school [10, 25, 65, 66].

According to our findings, recommendations regarding student assessment have highlighted that PE classes have to follow identical requirement levels of other disciplines, with relationship regarding content taught in the classroom and assessment consistent with such content. However, progress must be assessed individually to achieve positive self-concept development without criticism from others [34]. In this sense, monitoring this progress may be improved using different evaluation techniques, such as the inclusion of formative and summative assessments as well as the involvement of guardians to accompany the student's progress [11, 34, 37, 62, 84].

In accordance with United Kingdom's Association for Physical Education, any evaluation form in the PE curriculum should be part of a meaningful, planned, and progressive program based on integral student concept [80], that is, the form of assessment should not focus only on physical fitness components. Also, several national institutions have recommended that, through PE classes, students should be able to understand concepts related to human movement and progress in the development of their motor, cognitive, and social skills [21, 29, 34, 37, 52].

Table 3 (continued)

Methodological information				Target population				Recommended dimensions				
Institution/organization	Geographic scope of the institution/organization	Year	Type of document	Is PE primary in the document?	Students	Teachers	School managers and politicians	Parents/relatives	Policy and environment	Curriculum	Appropriate instruction	Student assessment
Ministry of Social Affairs and Health – Finland [35]	Governmental, national level	2010	Practice guide	No	X	X	X	X	X	X	X	
ICSSPE [36]	Institutional, international/regional level	2010	Institutional statement	Yes			X	X				
SHAPE America [37]	Governmental, national level	2010	Practice guide	Yes	X	X	X	X	X	X	X	X
CDC [38]	Governmental, national level	2010	Institutional scientific report	Yes		X	X	X	X	X	X	
Global Forum for PE Pedagogy (GoPEP) [39]	Institutional, international/regional level	2011	Institutional statement	Yes	X	X	X	X		X	X	
Ministerio de Salud y Ministerio de Deporte y Recreación – Costa Rica [40]	Governmental, national level	2011	Practice guide	No			X	X	X	X		
Ministerio de Salud Pública – Ecuador [41]	Governmental, national level	2011	Practice guide	No	X	X	X	X	X	X	X	
CDC [42]	Institutional, national level	2011	Institutional recommendations	No	X	X	X	X	X	X	X	X
Ministerio de Salud Pública y Bienestar Social – Costa Rica [43]	Governmental, national level	2012	Practice guide	No	X	X	X	X	X	X	X	
ParticipACTION Advisory Groups [44]	Institutional, national level	2012	Practice guide	No	X	X	X	X	X	X		
CDC [45]	Governmental, national level	2012	Practice guide	No		X	X	X				
ICSSPE [46]	Institutional, international/regional level	2012	Institutional recommendations	Yes	X	X	X	X	X	X	X	
SHAPE America [47]	Institutional, national level	2012	Practice guide	Yes		X	X	X			X	

Table 3 (continued)

Methodological information				Target population					Recommended dimensions			
Institution/organization	Geographic scope of the institution/organization	Year	Type of document	Is PE primary in the document?	Students	Teachers	School managers and politicians	Parents/relatives	Policy and environment	Curriculum	Appropriate instruction	Student assessment
UNESCO [56]	Institutional, international/global level	2015	Institutional statement	No			X		X		X	
UNESCO [11]	Institutional, international/global level	2015	Institutional statement	Yes			X		X	X	X	X
The Commonwealth [57]	Institutional, international/regional level	2015	Institutional statement	No	X	X	X	X	X	X		X
American Heart Association [58]	Governmental, national level	2015	Institutional scientific report	Yes	X	X	X		X	X	X	X
Ministerio del Deporte – Chile [59]	Governmental, national level	2016	Practice guide	No	X	X	X	X	X	X		
Federal Ministry of Health – Germany [60]	Governmental, national level	2016	Practice guide	No	X	X	X		X	X		
SHAPE America [61]	Governmental, national level	2016	Practice guide	Yes			X		X			
SHAPE America [62]	Governmental, national level	2016	Institutional scientific report	Yes	X	X	X	X	X	X	X	X
Department of Health – Ireland [63]	Governmental, national level	2016	Institutional recommendations	No	X	X	X		X			
National Physical Activity Plan – United States [64]	Institutional, national level	2016	Practice guide	No	X	X	X	X	X	X	X	X
ACHPER [65]	Governmental, national level	2017	Institutional statement									
The Commonwealth [66]	Institutional, international/regional level	2017	Institutional scientific report	No			X		X	X	X	X
CDC [67]	Institutional, national level	2017	Practice guide	No		X	X		X	X		
CDC [68]	Institutional, national level	2017	Practice guide	No	X	X	X		X			

Table 3 (continued)

Methodological information				Target population				Recommended dimensions				
Institution/ organization	Geographic scope of the institution/ organization	Year	Type of document	Is PE primary in the document?	Students	Teachers	School managers and politicians	Parents/ relatives	Policy and environment	Curriculum	Appropriate instruction	Student assessment
Association for Physical Education – United Kingdom [80]	Institutional, national level	2020	Institutional recommendations	Yes		X	X	X	X	X		X

PE physical education, CDC Centers for Disease Control and Prevention, AHA, NASPE National Association for Sport and Physical Education, SHAPE Society of Health and Physical Education, ICSSPE International Council of Sport Science and Physical Education, UNESCO United Nations Educational, Scientific and Cultural Organization, ACHPER Australian Council for Health, Physical Education, and Recreation

Therefore, adjusting student assessments may contribute to PE teaching–learning process.

The main findings regarding the strategies that interact with PE address the need for action plans that support an active and healthy lifestyle to be promoted at school, encouraging integration among the different actors of the school context. Health policies at school are essential since a well-defined action plan can help adolescents adopt more active and healthy lifestyles. For instance, systematic reviews have shown that strategies that involve PE-related strategies combined with other actions (e.g., provision of environments for physical activity practice, school community training, and educational actions) are effective for promoting active and healthy lifestyles among children and adolescents [13]. In this context, each school community member has an important role in developing active lifestyles at school, and they should be supported by PE teachers, as leaders and school actors for providing supportive environments. This may help to provide daily active environments, as well as actions that encourage families and the community to participate in physical activity practices [34, 41, 44, 45, 48, 52, 59, 62, 74, 82, 84].

Lastly, our findings indicate that most publications did not have PE as their primary focus and had managers and teachers as their main target audience. This may be explained by the presence of a few institutions explicitly directed to the PE discipline, such as SHAPE America [84] and the European Physical Education Association [71]. In general, most of the institutions included in the reviewed documents presented global recommendations for physical activity and health, with most documents having certain sections related to PE classes. Moreover, managers and teachers have been the primary target audience of such documents because most of their recommendations are related to the dimensions of policy and environment, as well as appropriate instruction.

Based on our findings, the below implications can be considered for future research. Studies should focus on evaluating which strategies could be considered reliable, feasible, and sustainable when implemented on a large scale, considering the different actors involved in the schools and PE classes. For building bridges between theory and practice [86], studies should assess the types of barriers and facilitators in implementing such PE strategies, taking into account local, regional, national, and international contexts (e.g., the contextual difference between primary and secondary grades). Finally, there is a need to evaluate the long-term effectiveness of recommended PE strategies (as primary intervention strategies) to improve healthy lifestyle indicators among the population. For policy and practice, our summary of 21 recommendations for PE classes for healthy lifestyles

may aid stakeholders and policymakers when proposing PE classes for local, regional, and national policies and practices.

Some key strengths of this study should be noted. First, this scoping review has produced meaningful findings that provide a mapping of strategies that have been recommended for PE, helping to understand which types of strategies should be adopted in relation to each studied dimension. Second, we conducted this review following a rigorous methodology, in line with guidance for systematic scoping reviews [17]. Finally, we encompassed a range of documents from around the world, including documents from key institutions which prioritize the PE subject, allowing us to provide a more comprehensive overview of the current situation.

This review also has some limitations that should be acknowledged. A scoping review differs from other types of systematic reviews in that it does not aim to evaluate the quality of available evidence and does not present the same rigorous systematic process as other types of reviews. Nevertheless, a systematic scoping review aims to identify the main concepts related to a specific research area, which may allow one to identify findings that would not otherwise have been identified using traditional systematic review methods. Therefore, the studies included in this review were not evaluated in terms of their methodological rigor, and we did not intend to determine which strategies are effective in promoting an active and healthy lifestyle. Moreover, although we developed a wide encompassing search strategy, it is possible that some relevant studies could not be included, for example, documents and research that were not published in journals of the searched databases. However, it is important to highlight that these characteristics are common in systematic scoping reviews. Finally, we were unable to consider the different characteristics between primary and secondary school PE strategies.

Conclusions

We presented a mapping of evidence showing 21 potential strategies for PE classes focused on active and healthy lifestyles. Such strategies are linked to five dimensions aimed at different actors in the school community. Over half of the strategies are linked to the dimensions of policy and environment and appropriate instruction. Also, a policy with PE as a priority area is recommended, one in which PE is mandatory and valued at all educational levels, with a weekly frequency that contributes to an active and healthy lifestyle. Our findings also show the importance of guaranteeing experiences of human movement contents throughout the curriculum promoting physical, cognitive, and social literacy. This is important during the lifespan,

respecting the needs, preferences, and capacities of students according to their school levels. Other aspects addressed were the inclusion of a curriculum that follows standards with a sequential and progressive structure, adequate student assessments, and action plans supporting an active and healthy lifestyle at school.

Abbreviation

PE: Physical education.

Supplementary Information

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Additional file 1.

Additional file 2.

Additional file 3.

Additional file 4.

Additional file 5.

Additional file 6.

Additional file 7.

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Authors' contributions

ASB, FCPR, KSS, and VCBF conceptualized the review. VCBF devised the systematic search strategies. ASB and FCPR conducted the study selection. ASB, FCPR, EMC, MCT, PFS, KSS, and VCBF extracted the data. ASB and FCPR analyzed the data. ASB, FCPR, and VJMO drafted the manuscript. All the authors contributed to the writing of the manuscript. All authors have read and approved the final manuscript.

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Availability of data and materials

The summary of reviewed articles is available in Tables, Figures and Additional files.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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