



**The graduate in physical culture. Realities and challenges in the 21st century.
Enormous demands of modern life: Increase in life expectancy. Decrease in
mortality**

**El licenciado en cultura física. Realidades y retos en el siglo XXI. Demandas ingentes
de la vida moderna: Incremento de la expectativa de vida. Disminución de la
mortalidad**

¹Silvio Oraldo Abreu-Aday

Center for Educational Quality Studies and Scientific Research

<https://orcid.org/0009-0009-2572-7584>

silviooabreuaday@gmail.com

México, Monterrey

¹PhD in Physical Culture Sciences. Professor of the Doctorate in Physical Education at the Center for Educational Quality and Scientific Research Studies, Mexico.

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Abstract

Introduction: The increase in life expectancy, the reduction in mortality, and social, educational, and technological changes have modified the profile of the Physical Education graduate, expanding their area of action towards health promotion, disease prevention, and educational leadership.

Objective: To review the scientific evidence on the realities and challenges faced by graduates in Physical Culture in response to the demands of the 21st century.

Methodology: A systematic review was conducted following the PRISMA 2020 guidelines. A search was conducted in Scopus, Web of Science, and ERIC for articles published between 2020 and 2026 in Spanish, English, and Portuguese. After applying the inclusion and exclusion criteria, 12 studies were selected, whose methodological quality was evaluated using the Mixed Methods Appraisal Tool, with an average quality of 92.1%.

Results: The evidence showed an evolution of the professional role towards functions related to health promotion, health literacy, leadership, educational innovation, and interdisciplinary work. Similarly, the need to strengthen university education through digital competencies, formative assessment, and preventive approaches to respond to demographic and social changes was highlighted.

Discussion: The findings show a paradigmatic shift that positions the graduate in Physical Culture as a strategic actor for public health and social well-being.

Conclusions: The profession needs continuous curricular updates and the acquisition of interdisciplinary, technological, and leadership competencies to effectively address contemporary challenges.

Keywords: Professional competencies; Physical education; vocational training; health promotion; public health.

Resumen

Introducción: El aumento de la esperanza de vida, la reducción de la mortalidad y los cambios sociales, educativos y tecnológicos han modificado el perfil del licenciado en Cultura Física, ampliando su área de acción hacia la promoción de la salud, la prevención de enfermedades y el liderazgo educativo.

Objetivo: Revisar la evidencia científica sobre las realidades y los retos del licenciado en Cultura Física frente a las demandas del siglo XXI.

Metodología: Se llevó a cabo una revisión sistemática siguiendo las directrices PRISMA 2020. Se realizó una búsqueda en Scopus, Web of Science y ERIC de artículos publicados entre 2020 y 2026 en español, inglés y portugués. Luego de aplicar los criterios de inclusión y exclusión, se seleccionaron 12 estudios, cuya calidad metodológica fue evaluada utilizando el Mixed Methods Appraisal Tool, con un promedio de calidad del 92,1 %.

Resultados : La evidencia mostró una evolución del rol profesional hacia funciones relacionadas con la promoción de la salud, la alfabetización en salud, el liderazgo, la innovación educativa y el trabajo interdisciplinario. Igualmente se señaló la necesidad de fortalecer la formación universitaria mediante competencias digitales, evaluación formativa y enfoques preventivos para responder a los cambios demográficos y sociales.

Discusión: Los hallazgos muestran un cambio paradigmático que sitúa al licenciado en Cultura Física como un actor estratégico para la salud pública y el bienestar social.

Conclusiones: La profesión necesita una actualización curricular continua y la adquisición de competencias interdisciplinarias, tecnológicas y de liderazgo para enfrentar los desafíos contemporáneos de manera efectiva.

Palabras clave: Competencias profesionales; Educación física; formación profesional; promoción de la salud; salud pública.

Introduction

The 21st century is distinguished by significant transformations in demographic, epidemiological, technological, and educational areas that have redefined what society needs and, consequently, the profile of professionals who promote healthy lifestyles. The upward trend in life expectancy, the decrease in the number of deaths, and the prevalence of non-communicable chronic diseases have changed the focus of healthcare systems, shifting from a model centred on treatment to one based on the prevention and promotion of well-being and holistic health. Physical activity is one of the essential pillars for enhancing the quality of life at all stages of the life cycle, in a context that requires professionals with skills capable of facing increasingly complex challenges (Czarnecki et al., 2022; Dowling & Lewandrowski, 2024). Moreover, the social, economic, and cultural changes of the 21st century require education to be more inclusive, innovative, and focused on sustainable development. This necessitates a reconsideration of the conventional roles of professions related to health and education (Arruti & Paños-Castro, 2025).

In this sense, the graduate in Physical Culture is no longer considered simply an expert in sports pedagogy or physical training, but rather a professional who strategically intervenes in the promotion of public health, the prevention of pathologies, community development, and comprehensive education. Increasing scientific evidence indicates that systematic physical exercise significantly helps reduce risk factors associated with diabetes, obesity, cardiovascular diseases, musculoskeletal disorders, and functional decline related to ageing, and also promotes the social and psychological well-being of individuals (Czarnecki et al., 2022). Consequently, professional practice surpasses conventional sports spaces and becomes interdisciplinary in educational entities, community organisations, health centers, and public policies that seek to improve quality of life and promote healthy ageing (Dowling & Lewandrowski, 2024).

The historical evolution of Physical Education clearly manifests this transformation of ideas. Throughout a good part of the 20th century, the discipline focused on the development of physical performance, preparation for sports, and the improvement of motor skills. However, cutting-edge studies have shown that physical education is a key component in public health strategies, due to its potential to increase people's level of physical activity and prevent various diseases (Sallis & McKenzie, 1991). Later, the curricular proposals included viewpoints focused on health education, meaningful learning, and the comprehensive development of the student, promoting active methodologies and pedagogical approaches that reinforced healthy practices from the early years of life (Devís & Peiró,

1992). Evolution that, more recently, has been corroborated through the analysis of history and curricula, demonstrating the shift from primarily sports models to educational approaches based on including all individuals, constantly promoting healthy lifestyles, active citizenship, and human development (Carrillo-López et al., 2023).

This transformation has caused the professional figure of the Physical Culture graduate to expand significantly in recent decades. Contemporary international literature agrees that these individuals are responsible for promoting health, educating preventively, directing community physical activity programs, designing interventions for different groups, and coordinating intersectoral initiatives aimed at collective well-being. In this context, university students and professionals recognise that health promotion is one of the essential pillars of their professional identity, and they go beyond the classic approach that only focuses on competitive sports (Nasário et al., 2020). Moreover, it has been proposed that Physical Education is a privileged field for the development of skills related to holistic health, which allows for the adoption of healthy behaviours through innovative pedagogical methods (Harris & Cale, 2022).

In the same vein, the current professional must take on leadership roles in comprehensive models of school and community well-being, cooperating with interdisciplinary teams responsible for caring for the physical, psychological, and social aspects of health (Fleming & Kearns, 2022). This responsibility includes the coordination of comprehensive physical activity programs, leading processes within the institution to promote healthy lifestyles, and actively participating in the creation of educational and health policies (Shirotriya & Beighle, 2022). Similarly, contemporary approaches argue that the physical education teacher of the 21st century must become a facilitator of learning, a manager of inclusion, and an agent of social change capable of responding to the new demands arising from population ageing, cultural diversity, and rapidly changing technologies (Dobson, 2026). In this scenario, it is argued that health literacy is an essential competency that enables professionals to develop educational processes focused on helping individuals understand, interpret, and use health-related information to make responsible decisions throughout their lives (Hernaiz-Sánchez & Sal-De-rellán, 2026).

The creation of this new professional profile undoubtedly requires a comprehensive transformation of the university programs responsible for initial training. Several studies agree that to meet the new societal requirements, higher education institutions must constantly review their curricula, strengthening digital, interdisciplinary, research, and leadership skills. The adaptation of master's programs in Physical Education and Sports, in this sense, highlights the need to align educational processes with current social and professional demands (Mikhailova et al., 2020). Moreover, the processes of professional development sustained by critical reflection, pedagogical innovation, and continuous learning are emphasised by global trends in teacher training (Lipovec & Tekavc, 2023).

From initial training, significant challenges are also perceived in equipping future professionals to meet the demands of current educational systems. The reinforcement of training in health-related physical fitness assessment, the use of interdisciplinary methods, and the constant updating of curricular content are some of the most notable points (Liu et al., 2023). Similarly, the examination of teacher training in Physical Education, both in the past and in the present and future, reveals that it is necessary to reconsider conventional teaching methods to address new issues such as inclusion, public health, equality, and educational innovation (Curtner-Smith & Fletcher, 2024).

According to these changes, the competency profile of a graduate in Physical Culture currently includes skills that go beyond technical and disciplinary control. As scientific evidence indicates, teachers' health habits impact their credibility as promoters of active lifestyles; therefore, self-care is an important professional competence (Nowak et al., 2024). Critical health literacy is also presented as an essential element for understanding scientific information, making informed decisions, and directing educational processes aimed at different population groups (Zhang et al., 2026). Additionally, the rapid digitalisation of Physical Education is added, which incorporates emerging technologies, artificial intelligence, data analysis, and digital resources to optimise teaching, evaluation, and research procedures. This creates new challenges and opportunities for work (Chai et al., 2025). Likewise, specialised literature indicates that a quality physical education teacher must possess a mix of pedagogical skills, leadership, effective communication, professional ethics, the ability to reflect, and dedication to continuous learning. These

are fundamental factors for addressing current educational conditions (Villaverde-Caramés et al., 2021).

Current social transformations demand that professional practice includes inclusive perspectives and is aware of the diversity in family and educational contexts. The increasing diversity of family structures and the sociocultural traits of the student body requires the design of adaptable and flexible pedagogical interventions that respond to the demands of each educational community (Caminero-Medina et al., 2025). Likewise, the promotion of health must encompass the well-being of the educators themselves, encourage healthy work environments, and institutional plans that help elevate the quality of life of the teaching staff (Carmona et al., 2025). In this regard, evaluation plays a strategic role as an instrument that guides learning, provides feedback on the development of competencies, and allows for continuous improvement. Blázquez (2017) proposal regarding the formative assessment approach is established as a model to understand that assessment in Physical Education should transcend mere performance measurement and transform into a continuous, participatory process focused on the comprehensive development of students and professional skills.

Despite the increase in the number of research studies on educational innovation, teacher training, health promotion, and physical education, the existing evidence on the development of the graduate in Physical Culture as a professional capable of facing the challenges arising from population ageing, epidemiological transition, and the emerging social demands of the 21st century remains scattered. Therefore, it is essential to conduct a systematic review that summarises the existing scientific knowledge about the challenges and current realities of this profession, recognising the emerging competencies, changes in curricula, and development opportunities that facilitate strengthening its contribution to public health, education, and social well-being.

Method

This work was carried out through a systematic literature review, with the purpose of detecting, examining, and summarising the scientific evidence related to the challenges and realities faced by graduates in Physical Culture in response to the demands of the 21st century. It focuses mainly on those associated with the increase in life expectancy, the reduction of mortality, the promotion of health, and changes in educational and social contexts. The review was scheduled and conducted following the suggestions of the PRISMA 2020 statement (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), which is the global standard for the organization, execution, and presentation of systematic reviews, as it offers a methodological framework that ensures transparency, reproducibility, and scientific rigour in the processes of identification, selection, evaluation, and inclusion of research (Page et al., 2021).

The research question was formulated based on the purpose of the study and focused on determining the existing scientific evidence regarding how the role of the Physical Culture graduate has changed, as well as the professional skills required to face the demographic, technological, educational, and epidemiological challenges of the 21st century. As a result, the methodological process included defining the search strategy, selecting the databases, determining the criteria for including or excluding information, analysing the methodological quality of the studies using the Mixed Methods Appraisal Tool (MMAT, version 2018), and conducting a qualitative synthesis of the scientific evidence.

Data sources and search strategies

The bibliographic search was conducted in ERIC, Scopus, and Web of Science, selected for their importance in the fields of Education Sciences, Health Promotion, Sports Sciences, and Physical Education, as well as for their international prestige and multidisciplinary coverage.

Scopus was chosen because it is one of the most extensive databases in terms of peer-reviewed scientific literature, including journals with a high impact in the fields of health, education, and exercise sciences. The Web of Science was added due to its precision in indexing criteria and because it groups studies with high methodological standards, which allows for the acquisition of high-quality scientific evidence. Finally, ERIC was included because it is the most important database in the educational field, as well as

in teacher training and pedagogical innovation. This allows access to research related to the professional training of graduates in Physical Culture and the development of Physical Education at various educational levels.

The research covered publications made between January 2020 and June 2026, a period in which the most recent scientific production on topics such as teacher leadership, health literacy, professional competencies, curricular innovation, digital transformation, and the promotion of healthy lifestyles was concentrated. The works published in English, Spanish, and Portuguese were included because these are the most commonly used languages in the international scientific production of this field.

To create the search strategy, free terms and descriptors from the Medical Subject Headings (MeSH) and Health Sciences Descriptors (DeCS) thesauri were combined. To extend or limit the retrieval of records, the boolean operators OR and AND were used, along with filters related to peer-reviewed research articles, full-text availability, and a defined publication period.

Search equations

Scopus:

TÍTULO-RESUMEN-CLAVE ("educación física" OR "educador físico" OR "profesor de educación física" OR "profesional de educación física") Y TÍTULO-RESUMEN-CLAVE ("promoción de la salud" OR "alfabetización en salud" OR "envejecimiento saludable" OR "actividad física") Y TÍTULO-RESUMEN-CLAVE ("formación del profesorado" OR competencias OR "educación superior")

Web of Science:

TS=("educación física" OR "profesor de educación física") AND TS=("promoción de la salud" OR "alfabetización en salud" OR "actividad física") AND TS=("formación del profesorado" OR competencias)

ERIC:

("educación física") Y ("formación de docentes") Y ("promoción de la salud") Y ("competencias profesionales")

Eligibility criteria

Inclusion criteria:

- Original research articles that have a quantitative, qualitative, or mixed perspective.
- Studies conducted with physical education teachers, graduates in physical culture, physical activity experts, university students of physical education, or specialists linked to health promotion.
- Studies conducted in educational contexts, universities, communities, sports, or related to health promotion.
- Studies focused on professional skills, leadership, teacher training, health literacy, digitalisation, curricular innovation, promotion of healthy habits, or changes in the professional role.
- Articles published between 2020 and 2026.
- Articles that are available in English, Spanish, or Portuguese.
- Research fully accessible (HTML or PDF).
- Research published in scientific journals that are peer-reviewed and indexed.

Exclusion criteria:

- Theses, conference abstracts, book chapters, letters to the editor, technical reports, and opinions.
- Duplicate research found in different databases.
- Studies that focus solely on athletic performance and are not related to competitive professional practice, education, or health promotion.
- Publications that do not have the full text.
- Research that does not clearly describe the methodology used, the population analysed, or the methods employed.
- Studies whose findings do not align with the proposed research question.

Article selection procedure

The search in the bibliography initially found 296 records, of which 142 were found in Scopus, 98 in the Web of Science, and 56 in ERIC. Then, 64 duplicate records were removed using the Mendeley reference manager, leaving a total of 232 unique records for the selection phase.

In the initial phase, the titles and abstracts of 232 records were analysed; 158 publications were eliminated because they did not address the study topic, had different populations, or pursued goals different from those defined. 74 articles were considered potentially eligible from this process and were moved to the full-text retrieval step. However, it was not possible to retrieve 18 documents because there was no access to them or the full text was not available.

A total of 56 articles were thoroughly evaluated to determine their eligibility. After applying the inclusion and exclusion criteria, 44 studies were eliminated: 18 because they were related to contexts or populations different from the subject of study, 16 because their objectives did not match the established research question, and 10 because they did not meet the previously established methodological criteria. The selection process culminated with 12 scientific articles that were incorporated into the systematic review.

The evaluation of titles, abstracts, and full texts was carried out sequentially by two independent reviewers, who conducted the comprehensive selection process. When required, a third researcher was involved to ensure transparency and the reproducibility of the selection process in accordance with the PRISMA 2020 statement guidelines. The differences were resolved through consensus and academic debate.

Evaluation of the methodological quality of the studies

The Mixed Methods Appraisal Tool (MMAT), 2018 version, was used to assess the methodological quality of the twelve included studies. This tool is intended to evaluate qualitative, quantitative, and mixed methods research (Hong et al., 2018). Ten criteria were taken into account for the evaluation: the clarity of the objectives, the relevance of the methodological design, the rigour of the processes, the validity and reliability of the tools, the level of data analysis, the ethical aspects considered, the coherence between conclusions and results, the recognition of limitations in methodological terms, the informational transparency, and the relevance of each study from a scientific perspective.

The findings showed that the 12 studies had an average methodological quality of 92.1%, placing them all in the high methodological quality category. One study achieved 85%, three studies achieved 95%, and seven studies achieved 90%; all these results are within the high-quality range. The elements that demonstrated appropriate methodological rigour in all the analysed studies were the clarity of the objectives, the adequacy of the methodological design, the consistency of the data analysis, and the

scientific relevance of the findings.

The limitations found in terms of methodology included, among others, the incomplete description of ethical issues, the poor identification of methodological restrictions, and the lack of information on how reproducible certain procedures are. However, these weaknesses were specific and did not impact the overall strength of the evidence, because all the studies were published in indexed and peer-reviewed scientific journals, exhibited consistency between the objectives, methodology, and results, and provided relevant information to answer the research question.

Data extraction and analysis

An extraction matrix was created in Microsoft Excel based on the twelve selected studies. In it, variables such as the author, the year of publication, the nation, the purpose, the methodology used, the study population, the tools employed, and the variables that were analysed were recorded. The most relevant results and conclusions were also included. Simultaneously, the management of bibliographic references was carried out using the Mendeley reference manager. This tool helped in the organization of scientific literature, as well as in the identification of duplicate records and in the normalisation of references according to the guidelines established by the APA (7th edition).

The information was then analysed thematically, using an inductive approach that allowed for the recognition of common patterns, similarities, and differences among the studies. Six thematic categories, which served to structure the synthesis of the evidence, emerged from this process: (1) the changing professional role of the Physical Culture graduate; (2) the promotion of health and disease prevention; (3) new professional competencies; (4) the modification of university education; (5) leadership and educational innovation; and (6) challenges arising from demographic, technological, and social transformations occurring in the 21st century. This strategy enabled the critical integration of the results of the included studies and the development of an interpretive summary aimed at answering the research question and achieving the proposed goals.

Results

Table 1. *Methodological quality assessment results of the included studies*

Study	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	Total score	Methodological quality (%)	Category
Nasário et al. (2020)	1	1	1	1	1	0.5	1	0.5	1	1	9.0	90%	High quality
McLoughlin & Graber (2021)	1	1	1	1	1	0.5	1	0.5	1	1	9.0	90%	High quality
Berrigan et al. (2022)	1	1	1	1	1	1	1	0.5	1	1	9.5	95%	High quality
Centeio et al. (2023)	1	1	1	1	1	0.5	1	1	1	1	9.5	95%	High quality
Villaverde-Caramés et al. (2021)	1	1	1	1	1	0.5	1	0.5	1	1	9.0	90%	High quality
Liu et al. (2023)	1	1	1	1	1	1	1	0.5	1	1	9.5	95%	High quality
Nowak et al. (2024)	1	1	1	1	1	0.5	1	0.5	1	1	9.0	90%	High quality
Mellon et al. (2024)	1	1	1	1	1	1	1	0.5	1	1	9.5	95%	High quality
Bezeau et al. (2025)	1	1	1	1	1	0.5	1	1	1	1	9.5	95%	High quality
McKown et al. (2025)	1	1	1	1	1	0.5	1	0.5	1	1	9.0	90%	High quality
Drenowatz et al. (2025)	1	1	1	1	1	0.5	1	0.5	1	0.5	8.5	85%	High quality
Zhang et al. (2026)	1	1	1	1	1	1	1	0.5	1	1	9.5	95%	High quality
Overall average											9.21	92.1%	High quality

Note 1:

- C1 = The research objectives or questions are clearly stated and justify the study.
- C2 = The study design (qualitative, quantitative, review, etc.) is appropriate to answer the research objective.
- C3 = The methods, procedures, inclusion/exclusion criteria, and sampling strategy are clearly described.
- C4 = The data collection instruments or techniques are valid, reliable, and appropriate.
- C5 = The data analysis (statistical, thematic, comparative, etc.) is consistent with the research objectives and study design.

- C6 = Ethical aspects are reported (informed consent, institutional approval, confidentiality).
- C7 = The conclusions are supported by the results and adequately address the stated objective.
- C8 = The study acknowledges its methodological limitations or potential sources of bias.
- C9 = The methodological information allows replication of the study or provides sufficient detail for comprehensive understanding.
- C10 = The study provides useful, current, and relevant evidence for the field of knowledge.

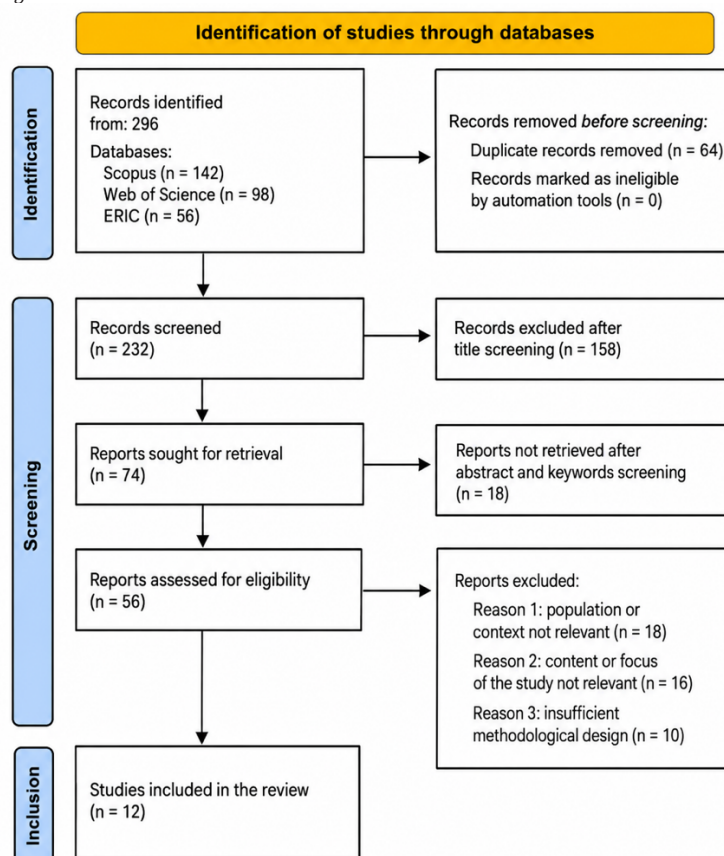
Note 2: Overall scoring: Yes = 1 point; Partial = 0.5 points; No / Cannot be determined = 0 points.

Note 3: Final calculation: Total score ÷ 10 × 100 = Methodological quality (%).

Note 4: Categories: 80–100% = High quality; 60–79% = Moderate quality; <60% = Low quality.

Source: Adapted from Hong et al. (2018). *Mixed Methods Appraisal Tool (MMAT)*.

Figure 1. PRISMA 2020 flow diagram



Source: Page et al. (2021).

Table 2. *Main characteristics and findings of the studies included in the systematic review*

No.	Author (Year)	Country	Sample / Age	Objective	Design / Instruments	Variables	Main findings	Conclusion
1	Nasário et al. (2020)	Brazil	Physical Education professionals and undergraduate students (adults)	To analyze attitudes and values regarding the role of physical education professionals in health promotion.	Cross-sectional study using a structured questionnaire.	Professional values, professional attitudes, health promotion.	Participants agreed that health promotion is a core responsibility of physical education professionals, showing favorable attitudes toward a preventive and interdisciplinary approach. However, differences were found between undergraduate students and experienced professionals in the way they perceived their competencies.	University education should strengthen health promotion as a cross-cutting component to consolidate the professional role within the educational and health systems.
2	McLoughlin & Graber (2021)	United States	Studies included in comprehensive school health promotion programs	To examine the contribution of Physical Education to comprehensive school health promotion programs.	Review of studies on school-based programs.	Physical activity, school health, health promotion.	Physical Education increased moderate-to-vigorous physical activity levels, promoted healthy habits, and improved coordination among schools, families, and communities.	Physical Education is a strategic component of comprehensive school health promotion programs.
3	Berrigan et al. (2022)	Canada	Elementary school students participating in	To evaluate the benefits of a daily physical activity program	Mixed-methods study combining quantitative	Daily physical activity, well-being,	Daily physical activity increased students' participation, improved physical	Programs led by specialized teachers produce sustainable

			a school-based program	supervised by specialized teachers.	analysis and interviews.	students' perceptions.	fitness, strengthened and motivation toward healthy lifestyles. Teachers also reported greater interaction and school engagement.	physical, social, and educational benefits.
4	Centeio et al. (2023)	United States	Physical Education teachers	To analyze the influence of teachers' attributes and attitudes on physical activity promotion.	Correlational study using questionnaires.	Attitudes, teacher leadership, physical activity promotion.	Teachers with greater self-efficacy, leadership, and professional commitment implemented more strategies to promote physical activity both during and beyond school hours.	Teachers' personal competencies directly influence the promotion of active lifestyles.
5	Villaverde-Caramés et al. (2021)	Spain	Scientific literature on teacher education	To identify the characteristics that define an effective Physical Education teacher.	Literature review.	Teaching skills, leadership, pedagogical innovation.	Leadership, communication, methodological innovation, reflective capacity, motivation, and ethical commitment emerged as the most frequently reported competencies.	Initial teacher education should focus on the comprehensive development of professional competencies rather than solely on technical expertise.
6	Liu et al. (2023)	United States	University faculty responsible for teacher education	To analyze university preparation regarding health-related fitness assessment.	Descriptive study using questionnaires.	University training, physical fitness assessment, professional skills.	Differences were found among universities regarding the time devoted to teaching health-related fitness testing, highlighting the need to strengthen practical training and data interpretation.	Health-related fitness assessment should be considered an essential competency for future professionals.
7	Nowak et al. (2024)	Poland	Physical Education teachers and university students	To determine the factors influencing healthy behaviors.	Cross-sectional study using validated questionnaires.	Healthy habits, physical activity, nutrition, self-care.	Teachers demonstrated healthier lifestyles than university students; however, both groups showed weaknesses in balanced nutrition and stress management.	Throughout their education and professional practice, Physical Education professionals should serve as role models for healthy lifestyles.
8	Mellon et al. (2024)	Canada	Elementary school teachers	To explore teachers' perceptions of promoting sleep within schools.	Qualitative study based on semi-structured interviews.	Sleep, school well-being, health promotion.	Teachers recognized the importance of sleep for learning and academic performance but reported institutional constraints and limited training to implement educational interventions on this topic.	School health promotion should include sleep education as a complementary component of physical activity.
9	Bezeau et al. (2025)	Canada	Physical Education teachers	To examine assessment methods used in health education.	Qualitative research using interviews and document analysis.	Assessment, health education, teaching competencies.	Formative assessment strategies focused on monitoring learning were the most frequently used. Nevertheless, differences remain among institutions regarding assessment criteria and instruments.	Assessment is essential for strengthening health literacy and meaningful learning.
10	McKown et al. (2025)	United States	University teacher education programs	To explore the preparation of future teachers as leaders of comprehensive school physical activity programs.	National descriptive study using an institutional survey.	Leadership, professional education, school programs.	Although most programs include leadership-related content, substantial differences remain in practical preparation for implementing comprehensive school physical activity programs.	Professional leadership should be reinforced from initial teacher education.
11	Drenowatz et al. (2025)	Austria	School adolescents	To examine the perceived importance of and attitudes toward Physical Education according to sex, age, and	Cross-sectional study using questionnaires.	Attitudes, perceptions, Physical Education.	Positive perceptions of Physical Education declined with age, with differences according to sex and nutritional status. Students who regularly engaged in	Physical Education teachers face the challenge of increasing students' motivation and participation.

				nutritional status.			physical showed favorable attitudes.	activity more		
12	Zhang et al. (2026)	China	Physical Education teachers	To develop a theoretical model of critical health literacy.	Qualitative study based on grounded theory.	Health literacy, teaching competencies, critical thinking.	Dimensions related to scientific knowledge, critical thinking, communication, decision-making, and leadership for health promotion were identified, resulting in an integrated model of critical health literacy.		Critical health literacy is an essential competency for Physical Education professionals in the 21st century.	

Source: Prepared by the authors based on the studies included in the systematic review.

Narrative synthesis

The analysed research reveals a significant transformation in the role of the Physical Education graduate, which has evolved from performing a traditional function focused on teaching motor skills and sports performance to developing a professional profile that promotes health, comprehensive education, and community participation. According to Nasário et al. (2020), health promotion is seen by students and professionals as a fundamental component of their professional identity, while McLoughlin & Graber (2021) point out that Physical Education is a key part of comprehensive school health programs, which helps increase physical activity levels and promote healthy habits. Likewise, Berrigan et al. (2022) have shown that daily physical activity programs led by specialised teachers generate improvements not only in physical condition but also in motivation, overall student well-being, and school participation. These findings are consistent with the ideas of Dobson (2026), who argues that the 21st-century professional must go beyond the role of instructor and transform into an agent of social change with the ability to act in the health, educational, and community sectors.

The promotion of health and the prevention of diseases are, nowadays, one of the fundamental pillars of professional performance, as also supported by the reviewed evidence. According to the research conducted by Nowak et al. (2024), the healthy habits of teachers directly affect their ability to promote an active lifestyle in students, which strengthens the teacher's role as an example of healthy behaviour. Following the same line, Mellon et al. (2024) expand the concept of health promotion by including sleep education as a fundamental component of overall well-being, while Bezeau et al. (2025) emphasise that assessment practices in Physical Education should not only focus on physical performance but also on tracking health-related skills. Likewise, the critical health literacy model developed by Zhang et al. (2026) demonstrates that effective communication, critical reflection, and informed decision-making are fundamental aspects for addressing current public health challenges. These results align with the suggestion of Sal-De-rellán and Hernaiz-Sánchez (2026), who propose that health literacy should be established as a transversal skill in the training and professional growth of Physical Education educators.

The review indicates that emerging professional competencies require skills beyond disciplinary mastery for the performance of the Physical Culture graduate. In their review, Villaverde-Caramés et al. (2021) consider ethical commitment, reflective capacity, communication, methodological innovation, and leadership as fundamental competencies; likewise, Liu et al. (2023) emphasise the importance of strengthening university education regarding the assessment of physical condition related to health and the interpretation of functional indicators for decision-making in the professional field. Similarly, McKown et al. (2025) demonstrate that initial training continues to show significant differences in the preparation of future teachers to lead comprehensive physical activity programs, highlighting the need to update university curricula. This educational transformation takes on special importance in light of the rapid process of digitalisation in Physical Education described by Chai et al. (2025), which highlights the inclusion of digital technologies, artificial intelligence, and data analysis as one of the most prominent global trends that will change professional skills in the near future.

Finally, the analysed research indicates that the challenges arising from demographic, technological, and social changes require professionals to have a greater capacity to adapt and intervene in an interdisciplinary manner. The decline in the appreciation of Physical Education that Drenowatz et al. (2025) have detected in some groups of adolescents indicates that it is necessary to create more

inclusive and motivating pedagogical strategies that meet the expectations of recent generations. Simultaneously, Centeio et al. (2023) find that leadership, self-efficacy, and teacher dedication have a significant impact on the implementation of effective programs to promote physical exercise. This is compounded by transformations in the workplace and educational sectors, which demand greater attention to the well-being of the professionals themselves. According to Carmona et al. (2025), it is important to develop institutional policies to support the health and quality of life of teaching staff. The entirety of scientific evidence shows that the graduate in Physical Culture faces a landscape characterised by an ageing population, technological innovation, diversity of educational contexts, and increased demands in terms of preventive interventions. This requires constant training, interdisciplinary skills, and an active commitment to policies that promote social development and health.

Discussion

The findings of this systematic review indicate a significant change in the role of the Physical Education graduate, confirming that the classical paradigm focused on motor skills instruction and sports performance has progressed towards a more extensive professional model, aimed at promoting health, preventing diseases, leading in education, and intervening in the community. The transition is due to new demands that have arisen because of the ageing population, epidemiological changes, digitalisation, and the variety of educational environments, elements that have reconfigured the competencies and duties of the Physical Culture specialist in the 21st century.

The findings corroborate that the transformation of the professional paradigm is one of the most important processes experienced by physical education in recent decades. Although the initial approaches maintained that the primary function of Physical Education was to collaborate with public health by increasing citizens' physical activity (Sallis & McKenzie, 1991), a pedagogical approach focused on the holistic development of the individual and educating for health was later established (Devís & Peiró, 1992). According to the findings of this review, this transformation continues to consolidate. Nasário et al. (2020) discovered that the same professionals consider promoting health to be part of their professional identity. This transformation aligns with the positions of Harris and Cale (2022), who argue that Physical Education must go beyond the instruction of motor skills and transform into an educational space focused on adopting healthy lifestyles. Likewise, Dobson (2026) argues that the modern professional has the responsibility to be a social change agent, with the ability to influence health, educational, and community spaces; this interpretation is fully supported by the evidence synthesised in this review.

The role of the graduate in Physical Culture in the face of population ageing and the rise of non-communicable chronic diseases is another aspect that has broad support from the reviewed studies. That people are living longer has created new demands regarding disease prevention, maintenance of functional capacity, and healthy ageing. In this line, Czarnecki et al. (2022) have shown that regular physical exercise provides psychological, functional, and physiological advantages throughout the entire life cycle, while Dowling and Lewandowski (2024) emphasise that to achieve healthy longevity, preventive models are needed where physical activity is one of the fundamental elements. This perspective is confirmed in the findings of McLoughlin and Graber (2021), which show that comprehensive school programs to promote health help to create healthy habits early on, thereby reducing risk factors related to chronic diseases in later stages of life. The critical health literacy model suggested by Zhang et al. (2026), on the other hand, develops this perspective by indicating that the ability to understand, analyse, and apply scientific information related to health is an essential competence to address current epidemiological challenges.

Moreover, the review confirms that nowadays, health promotion is the central focus of the professional practice of graduates in Physical Culture. The selected analyses demonstrate that Physical Education has gone beyond increasing motor efficiency and has included aspects related to physical, mental, and social well-being. Fleming and Kearns (2022) argue, in this line, that physical educators must integrate into school models that combine education, health, and community services to promote the overall well-being of students. Shirotriya and Beighle (2022), at the same time, believe that teachers have the

responsibility to lead comprehensive physical activity programs in schools, organising actions at the institutional level that promote the adoption of active lifestyles. The findings of Centeio et al. (2023) reveal that the implementation of strategies to promote physical activity is directly affected by teacher leadership, attitudes, and self-efficacy, while Bezeau et al. (2025) demonstrate that assessment practices aimed at health education benefit meaningful learning and student self-regulation. Mellon et al. (2024), additionally, add sleep education as another aspect of well-being, thus extending the classic health promotion approach that has been developed from Physical Education.

The data show that higher education institutions face the challenge of adjusting their academic programs to an increasingly complex work environment in terms of university education. According to Mikhailova et al. (2020), the transformation of graduate programs has been driven precisely by the need to prepare professionals with interdisciplinary skills to face new social challenges. Lipovec and Tekavc (2023) assert that continuous professional development and pedagogical innovation are essential for teacher training today, thus supporting this need. Moreover, according to Curtner-Smith and Fletcher (2024), teacher training must simultaneously address the demands of educational innovation, public health, and inclusion. The findings of Liu et al. (2023) show that significant differences persist between universities regarding training in physical fitness assessment and health promotion. For their part, Villaverde-Caramés et al. (2021) and McKown et al. (2025) emphasise that from the initial training of future graduates in Physical Culture, it is necessary to strengthen skills such as leadership, communication, formative assessment, decision-making, and school program management.

Educational innovation and digital transformation are related to another significant finding of the review. Digital technologies are significantly altering the methods of assessment, teaching, learning, and research in Physical Education, according to the results. According to the bibliometric study conducted by Chai et al. (2025), virtual environments, data analysis, artificial intelligence, and smart devices are the most prominent trends that will define the future of the field. These modifications align with what Arruti and Paños-Castro (2025) have argued: the educational challenges of the 21st century require professionals who are capable of adapting to contexts marked by constant innovation and rapid technological development. From this perspective, Dobson (2026) asserts that the expert in Physical Culture must acquire digital skills that facilitate the creation of more individualised pedagogical tactics, employ technologies to monitor learning, and take an active part in educational innovation processes.

Finally, the analysed research indicates that the increasing diversity in social and educational environments requires an interdisciplinary and inclusive professional approach. The alterations in family structures, studied by Caminero-Medina et al. (2025), require pedagogical practices that can address a student population with increasing diversity. Carmona et al. (2025), on the other hand, highlight that health promotion strategies must take into account the well-being of the teaching staff, as the health of teachers is a fundamental element for the success of educational actions. The proposal by Hernaiz-Sánchez and Sal-De-rellán (2026) also adds to this. They assert that health literacy must be consolidated as a transversal skill that allows teachers to direct educational processes based on scientific evidence and responsible decision-making. These results, in general, indicate that the graduate in Physical Culture plays a strategic role in creating educational environments that are healthy, inclusive, and socially sustainable.

It is necessary to consider certain limitations of this analysis when interpreting its results. First, the literature search was restricted to the Scopus, Web of Science, and ERIC databases. Therefore, research solely indexed in specialised sources may not have been retrieved. Additionally, only publications in English, Spanish, and Portuguese were included, which may have restricted the incorporation of evidence published in other languages. All the included studies had high-quality methodology, but there was a lot of disparity in their designs, population, educational setting, and analysed variables. This made a quantitative meta-analysis impossible, so a narrative analysis was conducted. In the end, publications from 2020 to 2026 were reviewed; therefore, future studies could extend the analysis period, include new databases, and implement comparisons between geographical regions or educational levels in order to delve deeper into the evolution of the role of the Physical Culture graduate in the face of the emerging challenges of contemporary society.

Conclusions

The graduate in Physical Culture has undergone a profound transformation of their professional profile to meet the demands arising from the increase in life expectancy, the decrease in mortality, and the growing complexity of educational and social scenarios in the 21st century. The analysed scientific evidence demonstrates that professional practice has transcended the traditional focus centred on sports teaching and the development of physical abilities, consolidating itself as an interdisciplinary field orientated towards health promotion, disease prevention, health literacy, educational leadership, and the implementation of comprehensive physical activity programs. Likewise, the review confirms that current professional competencies require integrating pedagogical, scientific, technological, and social knowledge to effectively respond to contemporary challenges, thus achieving the objective of synthesising the main realities and challenges faced by the graduate in Physical Culture in the current context.

In the academic field, undergraduate and graduate programs must strengthen competency-based training, incorporating content related to health promotion, critical health literacy, digital transformation, leadership, formative assessment, applied research, and interdisciplinary work. From a professional practice perspective, the graduate in Physical Culture must consolidate their participation in multidisciplinary teams, educational institutions, community programs, and public policies aimed at promoting active and healthy lifestyles throughout the life cycle. Similarly, it is necessary to promote strategies for continuous updating that favour the development of digital competencies, the use of emerging technologies, and decision-making based on scientific evidence, thereby strengthening their contribution to public health, education, and social well-being.

As a future projection, it is recommended to expand research on the impact of the Physical Culture graduate in different population contexts and educational systems through longitudinal, comparative, and intercultural studies that allow for the evaluation of the effectiveness of new professional competencies in the face of demographic, technological, and epidemiological changes. Likewise, it is pertinent to develop research on the integration of artificial intelligence, data analytics, digital literacy, and emerging technologies in professional training and practice, as well as to analyse the contribution of these professionals to healthy ageing, the prevention of chronic diseases, and the reduction of health inequalities. These lines of research will promote the consolidation of a more innovative, sustainable, and interdisciplinary professional model, capable of responding to the present and future needs of society.

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Conflict of interest

The author declares no conflict of interest.

Author's contributions

Author 1: conceptualisation, research, project administration, writing, project administration, review, validation, and editing.

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