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Physical literacy in Europe: The current state of implementation in research, practice, and policy

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ABSTRACT

Background/objective: The holistic concept of physical literacy (PL) embraces different person-centered qualities (physical, cognitive, affective/psychological) necessary to lead physically active lifestyles. PL has recently gained increasing attention globally and Europe is no exception. However, scientific endeavors summarizing the current state of PL in Europe are lacking. Therefore, the goal of this study was to comprehensively assess and compare the implementation of PL in research, policy, and practice across the continent.

Methods: We assembled a panel of experts representing 25 European countries. Employing a complementary mixed-methods design, the experts first prepared reviews about the current state of PL in their countries (categories: research, practice/policy). The reviews underwent comparative document analysis, ensuring a transnational four-eyes principle. For re-validation purposes, the representatives completed a quantitative survey with questions reflecting the inductive themes from the document analysis.

Results: The document analysis resulted in ten disjunct themes (related to "concept", "research", "practice/policy", "future/prospect") and yielded a heterogenous PL situation in Europe. The implementation state was strongly linked to conceptual discussions (e.g., existence of competing approaches), linguistic issues (e.g., translations), and country-specific traditions. Despite growing scholarly attention, PL hesitantly permeates practice and policy in most countries. Nevertheless, the experts largely anticipate increasing popularity of PL for the future.

Conclusion: Despite the heterogeneous situation across Europe, the analysis has uncovered similarities among the countries, such as the presence of established yet not identical concepts. Research should intensify academic activities (conceptual-linguistic elaborations, empirical work) before PL may gain further access into practical and political spheres in the long term.

1. Introduction

1.1. The concept of physical literacy

In the past decade, the documentation of the scientific evidence on the high global physical inactivity prevalence has undergone substantial improvement in both quantity and quality.[1,2] Parallel to this, or even stimulated by calls to find solutions against this trend, there have been a growing number of research articles devoting their interest to the concept of physical literacy (PL).[3,4] In summary, the academic literature has yielded different PL definitions and conceptualizations.[5,6] The number of definitions underlines the diversity of different approaches, but also accounts for the cultural specificities across the world (e.g., the social element in the Australian framework or the spiritual element in New Zealand). According to the International Physical Literacy Association (IPLA), PL can be described "as the motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engagement in physical activities for life" (starting page).[7] When analyzing this widespread definition in more detail, it becomes apparent that PL cultivates intertwined domains for describing individuals' proficient engagement in physical activities: an affective domain (motivation and confidence), a physical domain (physical competence), a cognitive domain (knowledge and understanding), and lastly a behavioral domain (daily physical activity behavior).[8,9] In accordance with this multifaceted description, PL represents a holistic concept that emphasizes the inseparability of body and mind.[10,11] Moreover, PL has elaborated philosophical underpinnings, encompassing roots in monism, existentialism, and phenomenology.[11,12] For instance, phenomenological descriptions have often qualified PL as indicating a lifelong, idiosyncratic journey.[13] PL has stimulated a considerable amount of research projects and journal articles, finally culminating in several reviews on different topics and subjects such as PL conception,[4,6,13–15] measurement,[16–18] health aspects,[19] empirical findings,[20,21] specific target groups[22–24] as well as intervention issues.[3,20]

In addition to the increasing popularity of the concept on the scientific level, the value of PL has also been incrementally acknowledged in practice and policy. For instance, the Global Action Plan on Physical Activity 2018–2030 (GAPPA) has repeatedly suggested PL as a crucial, promising concept to address people's physical inactivity levels.[25] UNESCO gears the Quality Physical Education (QPE) guidelines for policy makers toward systematically promoting PL in educational contexts.[26] Furthermore, PL has even been suggested as a worthwhile goal for the 2030 Sustainable Development Goals by the United Nations.[27] Moreover, on the national scale, several organizations and associations have aligned their practical initiatives with PL. For instance, Canada has placed PL at the heart of the Sport for Life initiative, thereby creating partnerships between the sectors of education, recreation, sport, and health.[28] Similarly, SHAPE America acknowledged the value of the concept and set PL as the standard for students.[29,30] Finally, Sport Australia, supported by the Australian government, stressed the benefits of PL and has also resulted in a distinct Australian understanding of the concept.[31,32]

1.2. Physical Literacy Across the World

Although the numeric rise in PL endeavors is clear, the recent development on the scientific and practical/political levels has not permeated to all countries equally. For instance, a recent review on PL interventions demonstrated that the majority of scientific evidence on PL interventions has been delivered by projects from Australia, Canada, and Great Britain.[3] In contrast, the review did not register any scientific intervention endeavor from Africa, South and Middle America, or the western countries of France, Japan, Spain, or the United States.[3] In line with this finding, Margaret Whitehead's book *Physical Literacy Across the World* portrays Wales, Scotland, Australia, and Canada as case examples for the incorporation of PL by assigning these countries a central role in the international

overview.[33] In summary, these countries can be characterized as the 'flagships' of global PL dissemination. At the same time, the book demonstrates that positive developments can also be seen in India or New Zealand.[33] From a global perspective, substantial efforts remain to further expand the holistic and embodied idea of PL across the world.

When adopting a rather critical perspective on the current state of PL implementation, the focus is also directed on Europe. Whitehead's *Physical Literacy Across the World* has provided separate descriptions on the developments in Wales[34] and Scotland[35] with very promising dissemination progress found for the PL concept in these countries. However, in contrast, only a single chapter has been reserved for whole continental Europe.[36] As a strength, this description has identified some common challenges in this region. For instance, it has been argued that physical education and movement education cannot be fully understood without the traditions of the different countries. A limitation of this work is that the chapter is largely dominated by Dutch experiences, which undermines its generalizability for whole Europe.

In total, the current literature suggests the following: first, there is an unbalanced reporting regarding the current state of PL across Europe. As a result, there is no overview on PL for some European countries or regions available at all. In this regard, cultivating a more extensive and differentiated view would be highly beneficial to understand the specific situation within the European countries and, thereby, to be able to provide nuanced recommendations for researchers, practitioners, and policymakers. Second, the PL literature continues to gain considerable momentum.[3,4,15] Against this background, updates mirroring the most recent developments, even for countries with in-depth activities and identified as case studies, would be beneficial.

1.3. Purpose of this study

Given that there is no aggregated overview in the literature providing comprehensive country-specific or comparative insights on PL in Europe, we identified the potential and necessity to adopt a broader perspective on the current situation in this continent. Using an expert approach,[37,38] the purpose of the present study was to take a European view on the present state of implementing PL by differentiating between research and practice/policy.[39,40] Specifically, the article addressed the following research questions: (1) What is the current state of PL in European countries and in Europe as a whole? (2) What are the commonalities and challenges for implementing PL across Europe (or certain European regions, respectively)? Based on the results, potential pathways should be derived for future PL efforts in Europe.

2. Methods

The present study used a successive, four-step research approach for addressing the two research questions. In the first step, experts were identified for the single countries. In this context, the International Physical Literacy Association (IPLA) took a decisive role for the growing snowball principle by suggesting contact persons, especially if no person was known to the first or last author. In the second step, the representatives of the single countries were invited to prepare short reviews about the current state of PL in their countries and to fill an overview table related to the categories 'research' and 'practice and policy'. In the third step, all reviews were subject to comparative document analysis by a group of two researchers (JC, PE). In the final step, the two researchers developed a survey to quantitatively re-validate the findings from the document analysis.

2.1. Expert identification

The IPLA can be considered a non-governmental organization on the international scale which organizes and promotes exchange on matters of PL including, for instance, initiatives on research, advocacy, and education. As a result of the discussions at the 2021 annual conference of the IPLA (European Session; October 13th, 2021), the first author (JC) contacted a board member (NG) of the IPLA with the intention to identify potential experts (e.g., persons who had topic-related publications or actively advocated the concept) for PL in Central Europe. Candidates were appointed for the following five countries: Austria (JJ, PH), the Czech Republic (JV), Denmark (PE, PB), France (CS, JG), and Switzerland (MRR). These candidates were contacted individually via electronic mail and invited to join the present initiative. Within the scope of initial conversations, three additional experts were gained through snowballing principle representing the countries of Germany (CT) and Belgium (AM, KDM). At a later stage, the group decided to not limit itself to Central Europe but to include perspectives from other regions of Europe as well. This finally culminated in contacts (again mainly promoted by the IPLA) to representatives in Croatia (BG, DS), Cyprus (EC), England (NG), Finland (KS), Greece (VR), Italy (VZ), Lithuania (AE, BM), the Netherlands (IvH), Norway (JB), Poland (ILK), Portugal (JM, MO), Romania (TMI, BO), Scotland (GB), Wales (AB, LE), Spain (MMM), Sweden (AF, SL), Türkiye (GY), and Ukraine (IP). Two experts expressed their initial willingness to contribute to the study (Slovenia, Bulgaria) but did not respond to several emails repeatedly and, thus, had to be withdrawn from the process. All individuals of the 25 participating countries provided consent to contribute to this expert-driven project and to work together constructively in three structured online sessions.

2.2. Review phase

In the first two online meetings, all country representatives were asked to describe the current relevance of PL for their respective countries. Their summary should contain two interrelated parts. First, the representatives were asked to produce a text describing the importance of PL in their country – in the following named (short) review. In this regard, the representatives could report freely as soon as both research aspects and practice/policy aspects were included. However, the experts were asked to limit country-specific descriptions to two pages not to inflate the length of reviews excessively. Second, the representatives were asked to fill a table that was categorized into a *research* perspective, on the one hand, and into a *practice and policy* perspective,[39,40] on the other. This differentiation of results accounts for the finding that PL has both a theoretical (idealist position) and a practical (pragmatic position) value.[21,40] Within the scope of the second meeting, the whole group defined a deadline for the electronic transmission of the short reviews and the pre-structured table (April 2022).

2.3. Comparison phase: comparative document analysis

The first author (JC) collected all country-specific descriptions. Subsequently, the short reviews with the pre-structured tables were submitted to comparative document analysis[41] by following a transnational four-eyes principle under the involvement of a researcher from another country (PE). This procedure had the advantages that (a) two persons performed all analyses with the material and (b) these two persons came from two different countries (to detach from the same cultural/linguistic background). Among the qualitative methods, document analysis is "a systematic procedure for reviewing and evaluating documents" (p. 27).[42] Comparative document analysis has already been successfully

employed in cross-cultural studies on health-related topics.[43,44] The methodological approach comprised four steps:[41]

(a) reading of the material: b oth extractors read all reviews at least twice (for the initial familiarization and the subsequent data extraction);
(b) extraction of data: both researchers extracted direct quot ations of the country-specific reviews and assigned them to inductively derived (sub-)categories;
(c) analysis of data: the quotations of the sub-categories were analyzed and compared across different countries; categories were slightly refined by following an iterative process between re-reading and in-depth analysis (e.g., initially conference and network aspects were part of a remaining category but were then awarded an own category); as part of the comparative effort, the analyzing researchers placed particular emphasis on potential commonalities (homogeneity criterion) and differences (heterogeneity criterion);
(d) distillation of findings: the qualitative material was accumulated and re-validated with the country representatives by means of a quantitative rating.

2.4. Re-validation: survey and online-meeting

For re-validating the acquired qualitative findings in the sense of a complementary mixed-methods design,[45] the first and last author developed a quantitative survey in which the country representatives rated the current status of PL implementation along the ten aforementioned themes on a four-point scale (lowest value: 0, highest value = 3). To facilitate the rating and to compare the values between the different countries, we wrote operationalizing statements for the values of all four theme-related items (see Supplementary File 2). We thoroughly analyzed each value of the countries and categories separately and, subsequently, aggregated all items representing the current (i.e., the category "future/prospect" was excluded) state of PL to an overall implementation score. For visual purposes, we portrayed the quantitative sum score within a comprehensive map of the European country with colors (lower values [0] in black/red; higher values [3] in green) using the open-source online service MapChart. Finally, all members of the working group were invited to a third (concluding) online meeting in which the representatives of the participating countries discussed the findings of the study (communicative validation) and derived future directions for PL efforts in Europe. All experts fully read and approved the content of the manuscript.

3. Results

All single country-specific descriptions, conceived as the raw material undergoing systematic document analysis, can be found in Supplementary File 1 in an alphabetical order. A comprehensive summary with the most important aspects (as defined by the different representatives) about the current state of implementation in the different countries can be retrieved from Table 1. The inductive procedure resulted in a total of ten themes across the different reports: the four themes 'research projects and staff', 'research publications', 'assessment', as well as 'conferences and networking' were assigned to the category 'research'; we bundled the four themes 'PL in policy and health documents', 'PL in the physical education curriculum', 'PL in national sport documents or organizations' and 'practical initiatives' to the category 'practice and policy'; the themes 'general conceptual aspects' as well as 'future/prospect' were of overarching interest and, therefore, treated separately.

3.1. General conceptual aspects (comparative document analysis)

Most countries (48%) explicitly describe PL as a relatively new concept that has just recently witnessed its first introduction (Cyprus, Lithuania, Portugal, and Ukraine without exact date; Czech Republic in 2010, Austria in 2015, Greece and Italy 2016, France in 2018, Croatia and Spain in 2020, Romania in 2021). Several non-English speaking countries reported challenges in finding an adequate translation for PL (Austria, Germany, Cyprus/Greece, Czech Republic, Finland, Greece, Italy, Netherlands, Norway, Poland, Spain, Sweden, Ukraine). Typical for this situation, for instance, the Finnish document revealed: "there is no common understanding of physical literacy […], even though there are couple of suggestions that could be used" (Supplementary File 1, lines 559–561). In accordance with this situation, PL often stands in concurrence to other, more established concepts, such as *competence/Kompetenz* (Austria, Belgium, France, Germany), *Agogi* (Cyprus, Greece), or *Danning/Bildung* (Germany, Norway). As a result of linguistic issues, related concepts or constructs are meeting the character of PL to varying degrees, including "Bewegungskompetenz" (movement competence, Austria), motor literacy (Greece and Spain), "Alfabettizzazione Motoria" (Italy), physical alphabet or movement identity (Netherlands), movement literacy (Norway), "understanding movement" (Sweden), or "personal physical culture" (Ukraine). In most cases, these conceptual coexistences or sometimes divergencies were considered a barrier against the further use or dissemination of PL. In summary, the anglophone countries (especially England and Scotland) did not report such deep linguistic issues, although a Welsh translation ("Ilythrennedd corfforol") exists. Portugal and especially Denmark, which has already undergone a consensus process on PL, also did not mention considerable conceptual challenges. Interestingly, four countries drew parallels to the concept of health literacy when describing developments of PL (Germany, Italy, Poland, Switzerland).

3.2. Research (comparative document analysis)

3.2.1. Research projects and staff

The majority of countries reported that only a limited number of scientific projects and researchers deal with PL as an approach. Accordingly, some countries could more extensively describe the small number of initiated projects (Austria with a pilot project in primary care, Cyprus with projects having primarily a sociological focus, Italy with a project for primary school children, Spain with a project on the development of an assessment instrument). As an alternative, some reports referred to single, important researchers or actors addressing PL, such as a professor (Finland), doctoral students (Denmark, France, Portugal, Romania, Scotland, Ukraine, Wales), or post-doctoral researchers (Demark). Cyprus, Italy, Lithuania, and Romania explicitly stated a lack of research activities in their countries. In addition, the representatives of Belgium, Finland, Lithuania, Poland, and Sweden indicated that there are projects that center around PL, but where the concept is not the core. As an example, the Belgian report disclosed that "PL-related behaviors and knowledge have been initiated […] but without a comprehensive and holistic perspective on the concept" (Supplementary File 1, lines 109–112).

Despite the limited extent of scholarly projects, there are several national (e.g., Denmark, France, Spain) and especially international collaborations to promote PL across several locations simultaneously. For instance, there appear to be cross-country projects in Europe between France and Belgium (evaluation project ELIP), between Austria and Scotland (development of a health care-based assessment) as well as between Germany and Poland (project on PL in physical education). Similarly, Wales have an established

Table 1
Characterization of the current state of PL for each country.

	Research	Practice and Policy
Austria	- Only few research projects on PL - Focus on physically inactive adults within the primary care setting - Activities refer to the evaluation of PL interventions and a measurement tool for PL	- PL not explicitly quoted in national policy documents on physical activity promotion - PL initiatives conducted in collaboration with the largest social insurance agency - Projects focusing PL as a transfer from science to practice
Belgium	- Early-stage research about the development of PL assessment tools in the school and health (chronic disease patients) contexts - Development of tools associated to PL (aquatic literacy, motivation) but without a comprehensive integration of the concept	- Consideration of PL as an umbrella concept in the new physical activity and health curriculum (Wallonia-Brussels) - Active school projects supported by the government connecting schools to local community (Flemish) - No explicit consideration of PL in the actual policies and out of school statements
Croatia	- Very recent topic - PL first mentioned in research on Croatian adolescents in 2020 - Few papers have been published regarding the validity and reliability of translated PL questionnaires in adolescents	- PL concept is not included in physical education curriculum nor in sports settings - PL interventions regarding cognitive and affective domains of PL created and implemented (on a local and not national level) - Creating PL projects, but on the local and not on the national level (yet) - No consensus statement about the PL in Croatian
Cyprus	- Recent appearance of the PL term in research - Limited number of researchers involved in related research - International collaborations with organizations working on PL have been established - Recent appearing of PL in national Scientific Symposiums and Conferences - Existence of other related concepts e.g., Olympic Education, Φυσική Αγωγή	- The notion is currently not referred to any official political position statements - Evidence and interest from the first sport related association (PASYPEFAA) on the concept - Appointment of a country lead by IPLA - Erasmus + Sports bids on Physical Literacy related projects
Czech Republic	- Growing popularity of PL in research (but in other nomenclature) - Using translation of existing tools to measure PL - Debate of experts on PL understanding - Expecting greater support for the concept in near future	- Working on revision of national curriculum documents - Teaching future PE teachers about the concept - Improving communication about the meaning of the concept - Expecting future project on PL
Denmark	- Growing popularity and funding of PL research - National/local groups of researchers interested in the concept, seminars and conferences held - Research activities within conceptualization, assessment and interventions initiated - Research papers published from various research groups - International collaborations established	- National intersectoral network established - Interest from national health body - Adopted as a key concept in national sporting organizations (DGI and Dansk Skoleidræt) - Consensus statement signed by several organization, institutions, NGOs, and companies - PL assessment included in large scale national representative sport and exercise survey
England	- Concept established by Margaret Whitehead - Initial work was to establish the philosophical basis of PL and advocacy - Further development of understanding related to intentionality, embodiment, and flourishing - Sport England – Active Lives Survey with five questions - Most recent research focus on assessment or charting progress	- International Physical Literacy Association established in 2014 - House of Lords report 'A national plan for sport, health and wellbeing' highlighted the importance of PL as a focus for PE in schools and for all ages and backgrounds - Youth Sport Trust fully support the focus on PL in schools - Sport England indicate that the elements of PL provide clear evidence in relation to their influence on children's attitudes towards valuing and engaging in physical activity - No explicit reference to PL in National Curriculum
Finland	- Position for associate professor in sport pedagogy and physical literacy at the university of Jyväskylä (Faculty of Sport & Health Sciences) - Research in PE focused more to SDT, which relates to key domains of PL (Affective, physical) - Expecting increasing attention in the next future, some projects starting to collect data around the topic	- No adoption of PL in political position statements - Practically no relevance for physical education curriculums (yet) - PL concentrates mainly on physical education, not on sport organizations or even national Olympic committee - No consensus statement about PL in Finnish
France	- Very recent topic - Advocacy - Creation of tools for young adults and older adults with chronic conditions - Potential links to sustainability	- Interest from PE and sport policy but no adoption of PL in any political statement - Private clubs start to adopt PL as a key framework - Participation of France in a European consensus around PL
Germany	- Growing popularity of PL in research - Most activities refer to interventional efforts - Expecting increasing attention in the next future - The field is strongly occupied by other related concepts (especially "competence")	- No adoption of PL in political position statements - Practically no relevance for physical education curriculums - Focus on the competence concept dominates PA practices - Few projects focusing PL as transfer projects (from science to practice)
Greece	- Recent topic - Few research papers and book texts published - Validation of the Canadian Assessment of Physical Literacy-2 for Greek children	- Adoption of PL in all school curricula and political statement - PL is identified with the objectives, strategies, and practices of physical education - Presence of PL in undergraduate courses for students enrolled in physical education and early childhood education - PE teacher training about the concept
Italy	- Very recent topic - Recently growing popularity of PL in research	- No adoption of PL in political position statements - No explicit reference to PL in National Curriculum

(*continued on next page*)

Table 1 (*continued*)

	Research	Practice and Policy
	- Expecting increasing attention in the next future	- Qualified PE teachers in primary schools starting from 2022/2023 - Expecting future projects on PL
Lithuania	- Very recent topic - Recognized in the academic field, however no significant study has been published yet - Separate aspects of PL are explored, however, gaps in the complex analysis are still apparent	- Initiative is taken by the Lithuanian Olympic Committee to adopt and implement PL in preschool and primary school (however actions are fragmented) - PL has not been promoted on the policy level yet - A new project is prepared that includes PL as a basis and that accounts for the new physical education curriculum - Increasing implementation in PE practice is expected for the future
Netherlands	- First publication on PL in 2013, publication of a whitepaper on PL in 2019, chapter on PL in continental Europe in *Physical Literacy across the World* (2019) - Contact with IPLA - Growing popularity of PL in research - PL highly influenced by other (than pedagogical) scientific fields, such as motor learning, talent identification, monitoring and assessment	- Increased attention, debates, publications for professionals - No adoption of PL in political position statements - The revision of national curriculum documents is influenced by the debates on PL, but no explicit reference to PL - Introduction and use of alternative (but similar) concepts in curriculum documents, such as *sport identity* and *movement identity*
Norway	- National/local research groups are interested in the concept - Field strongly occupied by other related concepts ("dannelse"/*bildung*) - PL part of debates surrounding the justification of "Kroppsøving" (PE) - Ongoing research related to PE on life skills and health literacies	- Teaching future PE teachers about the concept - No explicit reference to PL in the national curriculum - The national curriculum is occupied by related concepts (lifelong joy of movement) - No adoption of PL in political position statements
Poland	- Very little research on this area - First research activities refer to the validation of the CAPL-2 - Challenge with the translation of the PL term into Polish	- PL is not mentioned in policy and education documents - Elements of PL are conceptualized in the PE curriculum - National and regional projects deal with PL elements
Portugal	- Recent topic and growing popularity of PL in research - PhD Studies for developing instruments for measuring PL in PE and aquatic contexts (early-stage research) - Researchers' participation in international projects - Research papers published, seminars and conferences held - Lack of intervention studies - Expecting increasing attention in the next future	- PL is firstly adopted in political statements and documents - Intersectoral collaborations of the FMH/UL team with ministries, other university partners, and municipalities. - PL is aligned with the PE curriculum goals - Some transfer projects with a focus on PL - PL training is implemented in undergraduate, master, post-graduate, PhD, and CPD levels
Romania	- The concept is extremely recent - Only the cognitive field is highlighted - It is used to propose a "knowledge-based approach" to PE	- The all-encompassing concept is not found - Changes in the curriculum that introduce a theoretical content - A PE textbook was published for the 5th and 6th grades
Scotland	- Further research on understanding 'literacy' within PL - Continued development of a communication strategy - PL assessments in a regional weight management programme and in the annual school's physical activity survey - Public Health Scotland awarded a grant to test and deliver a new 2-h module to promote physical activity using a PL lens (in collaboration with sportscotland and education specialists)	- PL national workshop delivered in partnership with IPLA, Scottish Government and Public Health Scotland (2019) - PL included in the new National Physical Activity Referral Standards - PL was mentioned (IPLA definition) in: Convention of Scottish Local Authorities (COSLA), 2021. *The Positive Contribution of Physical Activity and Sport to Scotland* - Several regions (in cooperation with IPLA and sportscotland) provide training for health care staff, clinical and leisure staff, early years practitioners, parents, and teacher students - No explicit reference to PL in National Curriculum
Spain	- Very recent topic with growing popularity - Few research projects in PL - First PL assessment tool in Spanish and use of existing PL tools (in the process of translation and validation) - First descriptive and correlational studies on PL and teacher education in PL were published	- No inclusion of PL in any educational curriculum - Physical education and sports organizations emphasized the importance of PL and motor literacy toward government administrations - Multimedia content and projects related to PL were disseminated by the COLEF Council
Sweden	- Lack of empirical PL research - Research activities are undertaken within the conceptualization of movement capability - National group of researchers applied funding for PL research projects - Links between the conceptualization of PL and aspects of sustainability (e.g., embodiment, lifelong learning) are explored in the school curriculum	- Municipalities and Sports Confederation and Special Sports Confederation adopt conceptualizations of PL and are engaged in projects - No explicit reference to PL in the national curriculum - The national curriculum is occupied by related concepts (e.g., lifelong learning, confidence in own physical ability)
Switzerland	- Lack of PL research, but research on the domains of PL (cognitive, physical, emotional, social) in the PE context - Some private schools are researching about PL and develop respective programs - Literacy is a motor of research and development in general (and especially the link between health literacy and physical activity)	- PL not explicitly quoted in national policy documents on physical activity promotion - No adoption of PL in political position statements - Revision of national curriculum documents is influenced by the debates on PL, but no explicit reference to PL - The domains of PL are seen in the curriculum
Türkiye	- Although two studies were conducted in 2012, the concept is recent with growing popularity in research - Pioneer research activities focused on the adaptation of PL measurements - Comparative study on PE and primary school teachers' PL perception was published (important for the K-12 system) - There are no NGOs or initiatives that have been created to support PL research	- No adoption of PL in political position statements at national and regional levels - Although there is no direct emphasis on the PL in K-12 PE curricula, the components of PL such as health and active lifestyles, life skills, and movement competency were mentioned - There are no NGOs or initiatives that support PL policy

Table 1 (*continued*)

	Research	Practice and Policy
Ukraine	- Very recent topic, only a few studies in this area - Comparisons of the PL term with existing national analogues to facilitate cultural adaptation - Using translations of existing tools, and the selection of culturally and contextually sensitive indicators for the creation of evaluation systems	- PL is missing in national-level documents - Interest to PL at the regional level - Implementation of a special course on PL for future teachers of physical education at Lviv State University of Physical Culture - Popularization of PL through public lectures for students and academic staff in the field of physical education and sport, in-service teacher training courses for physical education teachers
Wales	- PL research has mainly focused on the early years and primary school aged children - Research has focused on professional development programmes to enhance primary school teachers' knowledge and operationalisation of PL - Further research adopted an appreciative inquiry between different sporting organizations to promote PL - Wales Academy for Health and Physical Literacy mainly focuses on developing children's motor skills in the Foundation Phase (3–7 year olds) to support PL - PL was implemented (especially physical domain) in Dragon Challenge and Sport Wales' School Sport Survey	- Legislative action has underlined the importance of physical activity and health behaviours in children and young people through the 'Well-being of Future Generations Act' (2015) - Schools and Physical Activity Task and Finish Group report (2013) was a key driver for the policy focus on PL - Sport Wales released educative materials (a PL video and 'a journey through life' illustration) and fully adopted the IPLA definition. - Sport Wales invested £1.78 m in 2014 to develop the PL agenda through the 'Physical Literacy Programme for Schools' (2014–2017). - Sport Wales focused on PL in the community by employing PL consultants to work with National Governing Bodies (2018-present). - The Curriculum for Wales (2022) Health and Wellbeing Area of Learning and Experience has been informed by core principles of the PL concept, though no explicit reference to PL is in the Curriculum for Wales (2019)

collaboration with academics in Australia. Notably, the most prominent projects were Erasmus initiatives (PhyLit; Physical Literacy for Life) involving research groups from (among others) Denmark, France, Lithuania, Portugal, Slovenia, Spain, Switzerland, and the United Kingdom. When taking a closer look at the purpose and content of the different projects, considerable diversity was found among the different countries, including projects with a focus on motivational aspects (Denmark), resilience in physical activity (France), socializing agents (Cyprus), aquatic experiences (Portugal), teaching styles (Italy), health consequences (Denmark, Italy), physical activity levels (Croatia, France, Scotland, Türkiye), community issues (Germany, Wales), interventions (Austria, Germany, Denmark, Norway, Wales), outdoor education (Norway), assessment development (see section 3.3.3), or professional teacher development (Wales). Finally, some reports disclosed that projects applications are currently running to acquire funding for PL initiatives (Czech, Spain, Sweden).

3.2.2. Research publications

In line with the analysis of the projects and actors in the previous chapter, the number of PL publications was, albeit heterogeneous in topics, limited in most of the included countries. There was great variety in publication format (e.g., books, conference contributions, chapters, articles) and some countries even highlighted theses as important contributions to PL in their countries (Czech, Greece, Portugal, Spain, Türkiye, Ukraine). Despite the low absolute research output displayed by most documents, we ascertained that the number of publications relative to the number of involved groups can be interpreted more positively. Accordingly, the developments in several countries often depend on the effort and achievements of a single person. The concentration on single actors or groups becomes particularly apparent when reading the reports from Austria, Croatia, Cyprus, Czech, Denmark, Greece, France, Italy, Portugal, Romania, and Ukraine. A substantial number of reports (Austria, England, Italy, Netherlands, Norway, Scotland, Wales) referred to the conceptual ideas by Margaret Whitehead (England), which implicates that she has substantially influenced the developments in Europe. For instance, Whitehead has contributed with a translated chapter to Norwegian literature.[46]

3.2.3. Assessment

Language-compatible measurement instruments have the potential to rapidly produce empirical research findings and may, therefore, be crucial for stimulating scholarly PL activities in the different countries. The number of references across the reports supports this relevance. In this regard, the anglophone countries clearly profit from the advanced status of English assessment instruments (England, Scotland, Wales). Croatia, Belgium/France, the Czech Republic, Denmark, Greece, Türkiye, and the Ukraine already possess translated PL assessments in their native language. Nonetheless, the Croatian group criticized that the "main limitation of studies investigating PL in Croatia is that only questionnaires assessing cognitive and affective domains were applied" (Supplementary File 1, lines 227–228). Portugal has created a new PL instrument for application in the physical education context.[47] Moreover, instrument developments and validations are currently under way in Austria, France, Germany, the Netherlands, Poland, Sweden, and Spain. Researchers across Europe most frequently undertook specific adaptations of the Canadian Assessment of Physical Literacy (CAPL or CAPL-2)[8] and the Physical Literacy Self-Assessment (PLAYself).[48] Despite the promising overall picture, only three countries reported that a PL assessment is part of larger survey activities. Sport England has undertaken the Active Lives Survey with five questions related to PL, and also Sport Wales School Sport Survey contained PL items but would have needed more questions with respect to children's motivation, confidence, knowledge, and understanding. A five-item PL measure will be included in a standardized monitoring system on the regional level in Scotland. From a conceptual perspective, the report from Wales raised a "call for more holistic and non-linear approaches to assess physical literacy" (Supplementary File 1, lines 1950–1951).

3.2.4. Conferences and networking

According to the analysis of the provided documents, several countries (Cyprus, Denmark, England, France, Germany, Greece, Lithuania, Poland, Portugal, Scotland, Spain, Sweden, Ukraine, Wales) already had structured academic exchange on PL on the national level, for instance, through networks or conferences. As an example, regular conferences were arranged in Sweden focusing on PL, linking mobility and community building to encourage people to engage in physical activity in everyday life. Notably, in Czech, England, French, Denmark, and Wales, exchange or consultation extended into ministerial and political spheres. In contrast, it was explicitly reported that no networks exist in Finland and Türkiye.

From an international perspective, the IPLA strongly promoted exchange on and advocacy for PL, with England taking the role of

the initial driver. In 2020, the AIESEP (Association Internationale des Écoles Supérieures d'Éducation Physique) has hosted a specialist symposium in 2020 in Belgium to innovate pedagogies for PL. Furthermore, the University of Lisbon (Portugal) has organized an international PL seminar under the Erasmus project "Physical Literacy for Life".

3.3. Practice and policy (comparative document analysis)

3.3.1. Physical literacy in policy

The reports revealed that PL plays hardly any role in political statements or health agendas/documents across the countries included. This circumstance was explicitly mentioned by Austria, Belgium, Finland, France, Germany, Italy, Norway, Poland, Romania, Spain, Sweden, Türkiye, and the Ukraine. More specifically, the Turkish review disclosed that "no NGOs or initiatives have been created to support PL […] policy in Türkiye" (Supplementary File 1, lines 1802–1803). Interestingly, the First Lady of Lithuania, Diana Nausediene, has taken advocacy for promoting PL in her country, with the COVID-19 quarantine clearly stressing "the undeniable need to develop general physical literacy, which becomes a vital need for the human being" (Supplementary File 1, lines 1029–1030). The concept has also permeated political documents in Portugal.[49,50] The anglophone countries again reported somewhat further progress. In Scotland, authorities on the local and regional levels used the approach with PL inspiring the Public Health Services. Although not embedded within Scottish policy, PL as a part of a cross-sector, life course approach is hoped to increase population levels of physical activity. In England, the 2021 House of Lords report on sport, health, and wellbeing underlined the developmental value of PL for children and declared the concept to be a key principle in the national plan. In a response statement, the government echoed the relevance of PL for tackling physical inactivity and well-being, especially when setting up national plans for the target group of children and the setting of schools. Finally, the Welsh Government (Llywodraeth Cymru) prioritized PL at the political level. More recently, Sport Wales has employed PL consultants to work with National Governing Bodies to embed PL into their strategies for the community setting.

3.3.2. Physical literacy in the physical education curriculum

The representatives of Belgium, Croatia, Czech, Finland, France, Germany, Italy, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, Türkiye, and Ukraine explained directly that educational curricula do not recognize PL as an explicit concept or principle. However, several reports declared that the existing curricular descriptions harmonize well with the idea of PL and its components, although they may not mention the concept verbatim (Belgium, Cyprus, Netherlands, Norway, Poland, Portugal, Scotland, Sweden, Switzerland, Wales, Türkiye). For example, the Portuguese representatives expressed: "In the PE syllabus, there is no explicit mention to PL, but the main goals resonate well with the PL concept" (Supplementary File 1, lines 1288–1289). In contrast, PL has entered the new 2021 curriculum of all tiers of the Greek curriculum and also Danish School Sports as a government-related organization has adopted the concept. Taking a critical perspective, Finland has fitness outcomes in its core curriculum, but it does not explicitly contain a knowledge and understanding aspect. Moreover, the Croatian and Cypriot representatives identified a gap between curriculum goals and factual practices, and Romania with its "sport-based approach" currently appears to be a distance away from meeting the holistic character of PL. Nonetheless, single representatives explained that PL may be considered in current or upcoming reforms in Czech, Finland, and Lithuania (LNOC initiative). In summary, there are only single countries in which PL serves as *the* concept for learning processes in the educational context.

3.3.3. PL in national sport documents or organizations

PL is not officially promoted as an explicit concept by the main sport organizations or federations in Croatia, Cyprus, Finland, Germany, Norway, Poland, Romania, Türkiye, and Ukraine. In this regard, the Ukrainian report can be cited representatively with the statement that "PL as a holistic concept is missing in national-level documents related to […] sport, and the promotion of physical activity." (Supplementary File 1, lines 1872–1873). In contrast, the major organizations in Denmark (DGI), England (Sport England), Lithuania (LNOC), Netherlands (NOC*NSF), Portugal (IPDJ, COP, DGS-PNPAF), Sweden (SSC), and Wales (Sport Wales) acknowledge the relevance of PL. In the country-specific reviews that indicated reasons and goals of sport organizations to adopt PL, the spectrum ranged from intended increases in sport participation and the detection of talents in the Netherlands to the promotion of a holistic (physical, social, mental, and athletic) human development for making people move throughout life in Sweden. The countries of Cyprus with the values of Olympism and Norway with its "sport for all" vision perceive at least high compatibility with the values of PL. Finally, there are smaller organizations in Cyprus (Pancyprian Association of Graduates of Physical Education and Sports Science), France (French Omnisports Federation), and Germany (dsj) which mention the concept within their relatively limited sphere of influence. The Cypriot association included PL into their goals and pointed out the importance of acknowledging and advocating for PL across different sectors, while the German organization underscores the value of PL by giving practitioners insights into a coaching project (iCoach Kids).

3.3.4. Practical initiatives

While PL has made relatively few inroads into documents and statements of policy, education, health, and associations, a number of countries reported projects in practice. In Austria, the region of Styria has undergone the roll-out of a PL intervention among physically inactive adults in the primary care setting.[51] Interventions with a focus on the cognitive and affective domain of PL have been conducted in high schools of eastern Croatia. Two ministries in Cyprus have disseminated a national fitness assessment program for adolescents in secondary schools. Interested parties in Denmark have formed a national cross-sectoral network and yielded a PL consensus among organizations, institutions, NGOs, and companies. French actors have implemented a PL intervention in a school and have provided toolkits to empower citizens, teachers, and coaches for promoting the concept effectively. Furthermore, Germany has yielded some participatory transfer projects to target students' health-related knowledge and understanding (school setting) and to reach elementary school children and their families (community setting). Lithuania has set up several projects to develop a PL-based education model for preschool and primary school children and to implement it with international partners from practice. Supported by several educational institutions, the Fitescola project has resulted in continuous professional development courses and modules for physical education teachers in Portugal. Scotland has numerous practical initiatives related to PL, including a regional communications campaign for adults, a local weight management service for families, routinization of PL assessments, as well as community instructor and primary teacher training (including plans to target other related groups across sectors). The Swedish experts listed four different projects, from physical activity promotion in children (modifying the school setting to promote the physical activity, health, and well-being of preschool children until grade six), supply of risky movement forms, leadership development to the promotion of environmental

changes for all people in the community. Finally, Wales has released comprehensive educative materials (videos, interactive illustrations) on PL and undertook efforts to also reach the community level. The biggest amount of money (2.3 million USD) was invested in the dissemination of "Physical Literacy Programme for Schools" (2014–2017) to address Welsh pupils in secondary school through a political agenda of increasing young people's engagement and confidence in schools and reducing the impact of deprivation on academic attainment.

3.4. Future/prospect (comparative document analysis)

Despite the currently limited implementation level of PL across Europe, the representatives of almost all countries anticipate an increasing consideration or popularity of the concept in the near future (Austria, England, Finland, France, Germany, Italy, Lithuania, Netherlands, Norway, Poland, Portugal, Scotland, Spain, Sweden, Türkiye). For instance, the Swedish experts commented that PL in their country "had a slow start but is now growing" (Supplementary File 1, line 1583) and the Scottish representative identified a "potential to increase traction in the coming years" (Supplementary File 1, line 1500). In this context, some stakeholders consider linguistic-conceptual clarifications (Austria, Cyprus, Germany) and advancements of assessment instruments (Austria, Croatia, England, Poland, Türkiye; ideally while considering non-linear approaches: Wales) as important steps or essential drivers for the dissemination of PL in their countries. The Romanian representatives leveled skepticism expressing that "changes are not to be seen soon, given that even in the discourse of researchers, the concept does not seem to be too popular" (Supplementary File 1, lines 1374–1375).

3.5. Revalidated summary (rating through quantitative survey)

All eleven items, including their introducing instructions and operationalizations for the four values, can be retrieved from Supplementary File 2. Among the different countries ($M_{all} = 1.03$), England scored highest in the total implementation rating ($M = 2.50$), followed by Denmark ($M = 1.90$) and Wales ($M = 1.70$). On the contrary, Romania ($M = 0.40$) and Poland ($M = 0.50$) displayed the lowest implementation status. Fig. 1 illustrates the implementation across Europe with a colored map. When analyzing the mean values per theme, the category future/prospect had the highest value ($M = 1.76$). This is in line with the qualitative material from the country-specific reviews. The mean values of all remaining items were located in the lower half of the scale (Item difficulty $\leq$0.427). More specifically, the current status of research publications was rated as comparably positive ($M = 1.28$), while assessments had the lowest mean value across the 25 countries ($M = 0.64$). Although the qualitative analysis would have suggested a better implementation score for Scotland ($M = 1.20$), taken together the survey largely corroborates the findings from the comparative document analysis.

4. Discussion

The PL approach has the potential to complement existing concepts related to physical activity through the simultaneous consideration of physical, cognitive, affective, and sometimes also social components. Driven by the holistic message, important documents (such as the GAPPA or the QPE)[25,26] recommend aligning national and international initiatives with this concept. However, not all countries have adopted this concept equally and, more importantly, academic literature has accumulated scant knowledge in regard to the implementation status on the European continent.[33] Therefore, the goal of the present study was to broadly assess and compare the PL situation across Europe.

This mixed-methods study revealed a heterogeneous picture of PL for Europe by reviewing and analyzing local expert descriptions (Research Question 1). In summary, the scholarly PL activities of most countries only refer to single research groups and projects, resulting in a limited number of publications and rather small networks. In parallel, PL rarely permeated PE curricula, policy documents, sport sectors, and practical initiatives. Surprisingly, we determined such an underdeveloped situation not only for the more east European countries of Romania, Cyprus, or Türkiye, but also for the highly privileged and populous countries Italy, Germany, and France. Conversely, the present analysis certified more advanced PL developments for England, Denmark, and Wales. While a recent consensus paper and a previous chapter have already described such developments for England and Wales, respectively,[34,52] this is the first study elucidating the more positive situation for Denmark. Scotland has displayed mixed findings, with the qualitative material confirming a report of a more advanced implementation status[35] and the quantitative approach implying space for improvement.

Taken together, the present study recognized the pattern that two factors play a major role with respect to the adoption of PL (Research Question 2). First, *language* turned out to be a decisive promotor for or barrier against the use of PL as a guiding concept. More specifically, not only the notion of "literacy" creates confusion issues, as translation equivalents often do not meet the original character, but in particular its combination with the attribute "physical".[53] Accordingly, the anglophone countries (England, Wales, Scotland participated in this study) more easily accept or incorporate this technical term. Second, related to that, PL often stands in "competitive" relationship to *existing physical activity approaches*, that have over decades become firmly entrenched within the different countries. In the case of compatibility of PL with these established concepts, PL must be translated appropriately to enable sound scientific exchange within the country and beyond the national borders. In case of no or incomplete compatibility with established concepts, the PL concept can, from a theory of science perspective, be interpreted as a "pre-paradigm" (page 47)[54] phenomenon that is initially represented by a small minority of the scientific community. Only when a concept is successful in addressing or explaining some of the "blind spots" of an established paradigm (the so called "normal science" (page 53)[54] paradigm), PL has the potential to gain increasing attention and may become an accepted scientific approach in the long term. In any case, our analyses showed that the PL concept cannot be understood without capturing the traditions and cultures of the included countries. This statement specific to Europe can be generalized more globally when highlighting the recent PL consensus for the Greater China Region which based on the assumption that, for instance, Confucianism or Taoism have to be respected when deriving a culturally tailored PL model.[14]

Furthermore, the present study demonstrated that the development of standardized assessment instruments or topic-specific networks may constitute an important step in intensifying PL activities. Valid and reliable assessment tools (quantitative) and standardized interview guides (qualitative) represent worthwhile opportunities to familiarize other researchers and stakeholders with a holistic framework and to broaden horizons through a multidimensional perspective. In general, such methodological steps often serve as catalysts for further empirical projects and studies. Similarly, the establishment of a network offers the potential to benefit actors who rely on or have interest in interdisciplinarity/transdisciplinarity – a description that harmonizes well with the PL approach, in specific,[20,30,55] and with research on

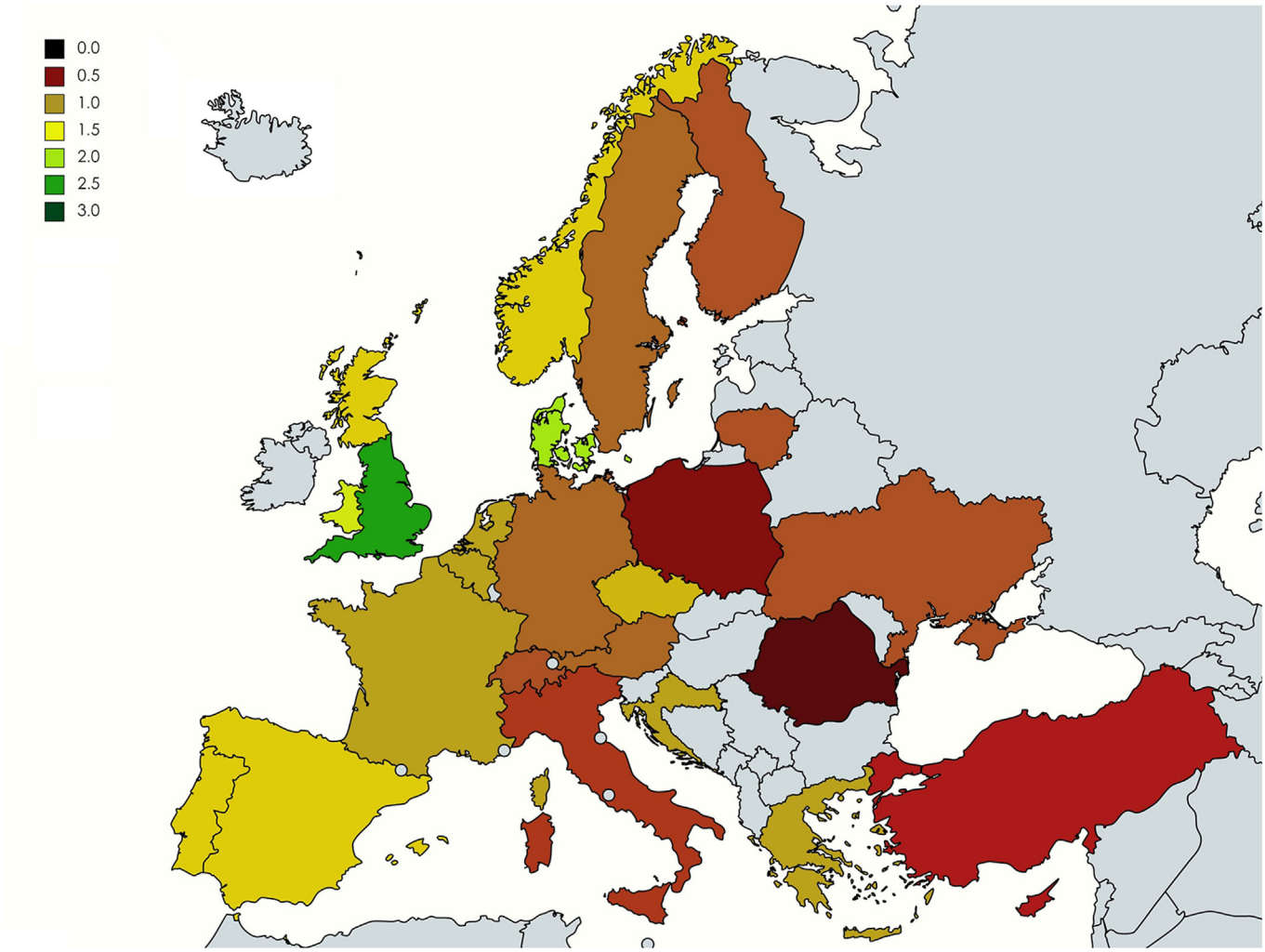

Fig. 1. A map of Europe visualizing the state of implementation in the participating countries (quantitative results).
Note: Details of the quantitative survey data can be found in Supplementary File 2; the map has been created with MapChart; grey countries did not participate in the present study.

exercise, sport, and physical activity, in general.[56,57] When deriving further recommendations from this study, we encourage researchers in Europe to formally analyze how the PL concept fits with the descriptions of physical education curricula and of the most important documents of the sport and policy fields within their countries. Ideally, this first-step analysis only takes place on a *descriptive* basis by targeting the question of whether and to which extent PL is compatible with the existing descriptions. We anticipate that a too *normative* impetus, especially in case of strong incompatibilities, may deter current protagonists of the practical or academic fields and, therefore, rather counteract the important task of spreading the holistic message of PL. Instead, it could make sense to acquire funding for empirical studies examining the postulated value of PL for physical activity and health[19,20] in further cultures and populations. But in addition to potential explorations of the concept on the national level, researchers may also continuously benefit from following international PL debates. As this study has shown, European countries often face similar linguistic, conceptual, pragmatic, political, and sometimes strategic problems when dealing with the PL approach. In this regard, international collaborations and partnerships can promote mutual learning processes and, hence, appropriate responses to challenges in the context of the holistic PL concept and its prominent philosophical underpinnings. Against this background, networks – whether it is, for instance, a special interest group of the IPLA, the initiated network of this European study, or scientific associations – are advised to point out potential pathways or future directions for the further course of PL in Europe. In this context, the present study has shown that the holistic claim of PL directed toward the fields of physical activity promotion, sport, and physical education (as suggested by the GAPPA or the QPE)[25,26] is not adequately met across the continent. In the future, researchers could conduct the same methodology, especially the quantitative survey, with the representatives again (e.g., after five to seven years) to map potential changes and developments in Europe. A repeated employment of the assessment instrument may serve to evaluate whether increasing efforts were taken to further disseminate the concept as part of the global strategy to work toward a reduction of physical inactivity prevalences by 15% in 2030.[25] Moreover, scientific projects could apply a similar approach in other areas of the world (e.g., Asia or South America), where PL development is not well described.

Despite the integration of multiple perspectives from different countries and the employment of a mixed-methods approach, the present study has some limitations. First, all country-specific reports were compiled by single actors (two persons at maximum) as part of a snowballing procedure. In this regard, the documentation of the situation depends on the expertise, experiences, and views of

single persons. Although subjective perceptions are highly important for classifying and evaluating implementation states,[58] the reviews may have been significantly affected by the idiosyncratic perspective of the representatives. As an alternative approach, researchers may have attempted to screen all documents in Europe referring to the PL concept. However, due to the extent of material acquired, this strategy has turned out to be economically unrealizable. Second, the defined word limit for the reports was driven by the purpose to concentrate the summaries on the most relevant aspects and to ensure comparability across the different documents. This text demand may have masked some single aspects of implementation, especially in countries with an advanced status and a larger number of activities. Third, we gathered the quantitative items from the ten themes of the qualitative material. Accordingly, the items were not psychometrically validated for this study. Given this restriction, we (a) introduced separate operationalizations for each item and response option, (b) did not compare aggregated scores for the meta-categories "research" and "practice and policy", (c) refrained from analyzing the survey from an inferential statistic perspective, and (d) just undertook descriptive analyses. Fourth, a total of 22 European countries (46.7%) were not included in the present study, which implicates that Europe as a continent was not represented as a whole. Unfortunately, we were not able to identify PL experts for each country or, in two cases, strategic reasons undermined the potential contribution to this initiative. Therefore, the challenging situation of PL in Europe may have even been biased positively in this study, as the identification of contact persons in countries without any PL activity would have been considerably more problematic. Nevertheless, the present study by far exceeds and updates previous attempts that have mapped the PL situation in Europe.[36] Experts from countries, that were not included in this project (researchers may have just initiated PL research), are welcome to contact the present network for their potential involvement in future updates regarding the situation of PL in Europe.

5. Conclusion

There is considerable heterogeneity in the degree of how PL is adopted and implemented across Europe. Only few countries (especially the anglophone countries) largely contribute to the registered growth in the attention toward this concept. As the implementation of the PL approach depends highly on the dominance of established concepts, we recommend researchers to invest substantial effort in clarifying the conceptual overlap, i.e., the basic (non-)compatibility, with PL in the different European countries. Researchers may draw on consensus methods[59] with further experts in order to materialize this in practice. The development of standardized instruments or reports on interventions may support the extraction of empirical arguments for or against following the PL approach in the different countries. In this context, practitioners and policymakers are encouraged to enable further experiences with the PL concept, for instance, by providing temporal, personal, and financial resources across the different countries and cultures. However, it may take some time until implementation progress, if achieved at all, is seen in the different regions of the continent. In this context, the inclusion of PL in important international documents, such as GAPPA or QPE,[25,26] combined with increasing evidence regarding the usefulness of the concept[20] may help to further enlighten the postulated advantages of the concept (e.g., holism, philosophic underpinning, life course perspective). In summary, the PL concept may contribute to a more holistic consideration of person-centered qualities for physically active lifestyles, with the present study delivering comprehensive insights regarding the current implementation of the concept in Europe.

Authors' contributions

Conceptualization: Johannes Carl & Peter Elsborg; Country-specific reviews and tables: All authors, except of the first and last author; Data curation: Johannes Carl; Formal analysis: Johannes Carl & Peter Elsborg; Funding acquisition (internal): Peter Bentsen; Investigation: Johannes Carl & Peter Elsborg; Methodology: Johannes Carl & Peter Elsborg; Project administration: Johannes Carl; Software: Johannes Carl & Peter Elsborg; Supervision: Johannes Carl, Nigel Green, Peter Bentsen, & Peter Elsborg; Revalidation: All authors; Visualization: Johannes Carl; Writing - original draft: Johannes Carl; Writing - review & editing: All authors.

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Declaration of competing interest

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Appendix A. Supplementary data

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