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STUDY PROTOCOL

Physical Literacy Assessment Protocol (PLAP): A Comprehensive Methodological Framework for Monitoring School-Based Physical Literacy in Children and Adolescents

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Abstract

This protocol was developed to enable evaluators to collect up-to-date data and generate comprehensive annual assessments of physical literacy (PL) among school-aged children and adolescents, using a set of key measurable criteria. Its purpose is to establish a robust methodological framework for monitoring school-based PL in this population. The Physical Literacy Assessment Protocol (PLAP) offers a standardized framework for identifying relevant trends and barriers affecting the development of physical literacy within educational settings. The protocol proposes 18 sociodemographic indicators, sourced from publicly accessible global databases, to describe the demographic and contextual profiles of participating countries. In addition, four operational dimensions comprising 12 content indicators have been specifically designed to assess core elements of PL: motivation, confidence, physical competence, knowledge, and environmental support. Each content indicator is assessed independently through a ten-point grading scale, enabling the synthesis of results into an evidence-based Country Card. The PLAP will also serve as the foundation for annual evaluator meetings, where national research teams collaboratively analyze outcomes and develop tailored national reports. These outputs aim to bridge the gap between research and educational practice, and to support policy development and school-based interventions that foster lifelong physical activity through targeted PL enhancement.

Keywords: *physical literacy, school-based assessment, children and adolescents, monitoring protocol, health promotion*

Introduction

Physical literacy (PL) is increasingly recognized as a key component of a healthy, active lifestyle and a cornerstone of contemporary physical education. Defined as "the motivation, confidence, physical competence, knowledge, and understanding to value and take responsibility for engaging in physical activities for life" (International Physical Literacy Association, 2017), PL encompasses more than physical fitness. It promotes lifelong well-being, social engagement, and cognitive development in children and adolescents.

Although rooted in philosophical traditions such as monism, phenomenology, and existentialism (Whitehead, 2010), the practical implementation of PL within school systems worldwide remains inconsistent and insufficiently monitored.

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As the concept gains recognition across academic, policy, and health sectors, there is an increasing demand for standardized monitoring systems to assess and foster its development from early childhood through adolescence.

The importance of PL becomes even more apparent in light of increasing sedentary behavior, physical inactivity, and screen time among youth. These trends have profound implications for physical and mental health, academic performance, and social development. In many countries, students spend a significant portion of their day in passive environments, often without access to quality physical education or structured opportunities for movement. Although various initiatives aim to promote physical activity, few are grounded in comprehensive, standardized measures of PL at national or international levels (Cairney et al., 2019).

Despite various national and international efforts to monitor physical activity in the general population, there remains no internationally standardized framework for assessing PL within or related to school settings. While independent studies have examined different dimensions of PL, the absence of harmonized indicators and grading systems limits cross-study comparability and reduces the relevance of findings for policy development (Edwards et al., 2018).

To address this gap, the Physical Literacy Assessment Protocol (PLAP) was developed. Its primary aim is to establish a comprehensive methodological framework for monitoring school-based PL in children and adolescents. Grounded in best practices from previous health surveillance systems, the protocol introduces 18 clearly defined sociodemographic indicators and four operational dimensions, which are further divided into 12 content indicators. These indicators are specifically designed to assess core elements of physical literacy, including motivation, confidence, physical competence, knowledge, and environmental support.

The PLAP enables national evaluators and researchers to collect timely, relevant data, conduct standardized assessments, and publish comprehensive annual PL Country Cards. These cards compile key statistics, identify critical challenges and disparities, and serve as actionable resources for educators, policymakers, and professionals in sport and health sectors. By highlighting strengths and gaps in school-based PL development, these reports aim to inform evidence-based interventions, shape educational policies, and foster environments that support physically literate, active, and healthy youth.

More importantly, the PLAP is not merely a tool for data collection, it is also a catalyst for change. By fostering collaboration among stakeholders and advocating for structured, school-based PL programs, it calls for concrete actions to enhance the health, development, and long-term well-being of children and adolescents worldwide.

Materials and Methods

A multidisciplinary team of sport science researchers and health promotion experts from China and Montenegro developed the PLAP to provide a comprehensive methodological framework for monitoring school-based PL in children and adolescents. The protocol draws on best practices in physical activity surveillance and has been adapted to address the specific needs of school-based PL evaluation.

The PLAP also initiates a structured process in which national evaluators, including education researchers, policymakers, and sport and health professionals, convene annually to assess the latest evidence on school-based PL within their respective countries. These collaborative meetings result in the development of standardized national reports, known as PL Country Cards, which integrate both quantitative outcomes and qualitative insights from focus groups. These reports are intended to guide school policy, support educational reform, and inform national strategies aimed at enhancing PL among youth.

Table 1. Country's demographic profile

Questions
Country name:
Total population:
% of population aged 5–17:
Urban population (%):
GDP per capita (US$):
Government expenditure on education (%):
Government expenditure on sports and recreation (%):
Public health expenditure (% of GDP):
Life expectancy at birth:
Physical activity prevalence (%):
Youth sedentary behavior prevalence (Y/N or %):
% of schools with PE at least twice weekly:
% of schools with access to PA infrastructure:
Teacher-to-student ratio in PE:
National Physical Activity Plan (Y/N):
National Physical Literacy Policy/Guidelines (Y/N):
Gender parity in youth sports participation (%):
Family/community facility access (%):

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This study protocol proposes 18 sociodemographic indicators, including country name, total population, percentage of the population within the official school-age range, as defined by national education systems , urban population, GDP per capita, government expenditure on education/sports and recreation/public health, life expectancy at birth, physical activity prevalence, youth sedentary behaviour prevalence, percentage of schools offering physical education at least twice weekly, percentage of schools with access to physical activity infrastructure, teacher-to-student ratio in physical education, national physical activity plan, national PL policy or guidelines, gender parity in youth sports participation, and access to family/community facilities. These publicly available indicators will be compiled to identify the characteristics of participating countries and to describe each country's demographic and contextual profile (Table 1).

This protocol also proposes four operational dimensions, divided into 12 content indicators, specifically designed to assess core elements of physical literacy. These dimensions are briefly described in Table 2. In addition, the authors of this study protocol will regularly gather feedback from stakeholders to refine and update the list of content indicators on an annual basis. External evaluations will also be conducted to assess the protocol's inputs, outputs, and its immediate, intermediate, and long-term outcomes.

Table 2. Physical literacy indicators and benchmarks used to guide the grade assignment process

Dimension	Indicator	Benchmark
Physical Competences	Agility and Movement Skills	% of children and adolescents who met the age- and gender-specific benchmarks from the Canadian Assessment of Physical Literacy (Longmuir et al., 2018). Agility and movement skills are assessed using the Canadian Agility and Movement Skill Assessment (CAMSA; Longmuir, 2017).
	Peak Aerobic Fitness	% of children and adolescents meeting age- and gender-specific benchmarks for peak aerobic fitness (Longmuir et al., 2018). Assessed using the Progressive Aerobic Cardiovascular Endurance Run (PACER; Scott et al., 2013) or similar tests.
	Torso Muscular Endurance	% of children and adolescents meeting age- and gender-specific benchmarks for torso muscular endurance (Longmuir et al., 2018). Assessed using the isometric plank test (Boyer et al., 2013).
Knowledge and Understanding	Health and Fitness Knowledge	% of children and adolescents who demonstrate understanding of physical activity guidelines, health benefits of exercise, and related concepts. This indicator evaluates awareness of how physical activity impacts the body and mind, including knowledge of endurance, strength, and flexibility.
	Safety, Risk, and Injury Prevention Knowledge	% of children and adolescents demonstrating knowledge of safe practices, injury prevention, and hazard recognition. This includes understanding warm-up routines, proper equipment use, hydration, and techniques to avoid injury.
Motivation and Confidence	Motivational Disposition	% of children and adolescents exhibiting enjoyment and interest in physical activity. This indicator reflects intrinsic motivation and predilection i.e., the desire to be active and enjoyment derived from participation.
	Perceived Competence and Confidence	% of children and adolescents displaying adequate self-efficacy for physical activity participation. Assesses a child's confidence and perceived competence in their physical abilities (self-efficacy).
	Attitudes and Beliefs about Physical Activity	% of children and adolescents aware of physical activity benefits and perceived barriers. This indicator measures belief in the importance of physical activity and recognition of potential barriers (e.g., lack of time, facilities, or support).
Daily Behaviour	Physical Activity Levels	% of children and adolescents achieving at least 60 minutes of moderate-to-vigorous physical activity (MVPA) daily, as recommended by the World Health Organization (WHO, 2019).
	Active Transportation	% of children and adolescents using active transportation (e.g., walking, biking) at least 3 days per week (Aubert et al., 2022; Tremblay et al., 2018).
	Sedentary Behaviour and Screen Time	% of children and adolescents spending no more than 2 hours per day on recreational screen time. This includes non-educational use of screens such as television, video games, and mobile devices (Tremblay et al., 2018, 2020; WHO, 2020).
	Sleep Duration	% of children and adolescents meeting age-specific recommended sleep durations (e.g., 9–11 hours for ages 5–13). Sleep is considered alongside physical activity and sedentary behaviour as part of the integrated movement behaviour cluster (Tremblay et al., 2020).

Each of the twelve indicators will be assessed using national datasets, peer-reviewed studies, government or NGO reports, and structured observations in school environments from the past ten years. Evaluation employs a 10-point grading scale, adapted from international surveillance protocols such as the Global Matrix 4.0 (Aubert et al., 2022) and the PEP Matrix 1.0 (Long et al., 2024). The scale ranges from 10 = Exceptional (≥90%) to 0 = Incomplete. Grades are determined through a synthesis of available evidence and consensus-based scoring among national evaluators. In cases of limited data or scoring disagreements, evaluations may be supported by external reviewers and expert panels to ensure transparency, consistency, and validity.

Table 3. Grading System and Evaluation

Grade	CI	Description
10	90% ≤	Exceptional
9	80%–89%	Excellent
8	70%–79%	Very Good
7	60%–69%	Good
6	50%–59%	Fairly Good
5	40%–49%	Satisfactory
4	30%–39%	Quite Satisfactory
3	20%–29%	Poor
2	10%–19%	Very Poor
1	≤10%	Failing
0	Insufficient or inadequate information to assign a grade	Incomplete

Note. CI – Class Intervals represent the difference between the upper and lower class limits of the available data.

The reliability of the content analysis in this protocol will be ensured through the operationalization of the PL concept for school-aged children and adolescents, the training of coders in applying standardized definitions of physical literacy domains, and the evaluation of annual cross-national coding audits (Riff et al., 2014).

To address potential subjectivity in data coding and grading, inter-rater agreement will be calculated using Cohen's kappa coefficient (κ), as recommended by McHugh (2012). This statistic offers a reliable measure of agreement between evaluators beyond chance, supporting the consistent and objective application of the PLAP framework.

Electronic databases (including Scopus, PubMed/MEDLINE, and Web of Science) will be systematically searched to identify relevant peer-reviewed articles. Additional sources such as the Open Access Theses and Dissertations (OATD) and the Networked Digital Library of Theses and Dissertations (NDLTD) will support the review of graduate-level research. Google Scholar and targeted web searches will also be used to locate grey literature, government reports, and educational policy documents essential for evaluating the content indicators.

The complete search syntax for each database is detailed in Table 4 and will be adapted to include the specific indicator and country of interest during each national assessment.

Table 4. Full search syntax used for each database

Database	Search Syntax
Scopus	(ALL (physical AND literacy OR indicator) AND ALL (kid* OR child* OR youth OR young OR adolescent* OR student*) AND ALL (school OR education OR curriculum) AND TITLE-ABS-KEY (country))
PubMed/MEDLINE	("physical literacy"[tw] OR "indicator"[tw]) AND (kid*[tw] OR child*[tw] OR youth[tw] OR young[tw] OR adolescent*[tw] OR student*[tw]) AND (school[tw] OR education[tw] OR curriculum[tw]) AND "country"[tiab]
Web of Science	TS=(("physical literacy" OR "indicator") AND (kid* OR child* OR youth OR young OR adolescent* OR student*) AND (school OR education OR curriculum) AND (country))
Open Access Theses and Dissertations (OATD), Networked Digital Library of Theses and Dissertations (NDLTD)	("physical literacy" OR "indicator") AND (kid* OR child* OR youth OR young OR adolescent* OR student*) AND (school OR education OR curriculum) AND (country)
Google Scholar and targeted web searches	"physical literacy" OR "indicator" AND kid* OR child* OR youth OR young OR adolescent* OR student* AND school OR education OR curriculum and country

Note. Replace the placeholders "indicator" and "country" with the specific term for each indicator being searched and the name of the country under investigation.

Discussion and Dissemination

The implementation of the PLAP is expected to drive meaningful progress in the monitoring, promotion, and development of PL among school-aged children and adolescents. By providing a comprehensive methodological framework, the protocol will bridges the knowledge-to-practice gap in physical education through translational science mechanisms.

In the short term, PLAP is expected to increase awareness among educators, policymakers, and stakeholders about the importance of PL and its current status across different regions. Research indicates that school-based assessments and targeted PL initiatives can enhance professional and institutional engagement in promoting physical activity among youth (Grauduszus et al., 2024). The standardized PL Country Cards produced through PLAP implementation will serve as advocacy and decision-support tools, enabling stakeholders to identify strengths and gaps within national education systems.

Over the medium term, the protocol is expected to inform education policy and drive curriculum reform by providing relevant, evidence-based insights. When governments are equipped with consistent and comparable data, they are more likely to adopt policies that enhance access

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to quality physical education and physical activity opportunities for all children (Schmidt & Hanssen-Doose, 2023). This is particularly crucial for addressing disparities related to socioeconomic status, geographic location, and gender.

PLAP also supports the long-term goal through life-course intervention modeling by enhancing PL during childhood and adolescence. Research indicates that youth with higher levels of PL are more likely to engage in regular physical activity and experience improved physical, cognitive, and emotional well-being (Jerebine et al., 2024). Furthermore, the knowledge, motivation, and confidence developed through school-based PL initiatives are strongly associated with sustained physical activity into adulthood (Cornish et al., 2020).

An additional anticipated outcome is the reduction of health disparities through data-informed, inclusive policy and program design. By identifying underperforming populations and settings, PLAP promotes the development of tailored interventions that advance equity in both education and health promotion (Mayordomo-Pinilla et al., 2025). The PL Country Cards will function not only as informational tools but also as calls to action, urging institutions to support all students in developing PL.

Finally, on a global scale, PLAP is expected to make a significant contribution to the expanding body of research on PL. By generating standardized data across diverse educational contexts, the protocol facilitates international comparisons and cross-cultural studies, enhancing our understanding of how PL can be effectively promoted worldwide (Jerebine et al., 2024).

Ethics Declarations

This study protocol was developed in accordance with principles of integrity, fidelity, and honesty. Users of the protocol are expected to uphold these values by taking responsibility for their actions, honouring their commitments, and acting transparently. Furthermore, they are expected to refrain from engaging in any behaviour that could cause intentional harm to others, whether human or animal.

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