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PHYSICAL LITERACY SUPPORT FROM CHILDHOOD TO ADULTHOOD: DEVELOPING MOTIVATION, AUTONOMY, AND EXERCISE LITERACY ACROSS THE LIFESPAN

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ABSTRACT

This paper brings together evidence from three complementary studies – those with Physical Education (PE) teachers, personal training clients and high-level personal trainers (PTs) - to examine how Physical Literacy (PL) is currently supported from childhood to adulthood, leveraging exercise literacy as a valuable new component. PL includes the motivation, confidence, physical competence and knowledge needed to sustain meaningful physical activity across the lifespan. In Serbia, however, PE teachers' philosophies and classroom practices appear misaligned. Qualitative findings show that although teachers value wellbeing, enjoyment and long-term habit formation, lessons largely remain traditional and performance focused, dominated by teacher-led instructional formats. Opportunities for autonomy, creativity and student-centred learning are limited, restricting pupils' development of self-directed capabilities that support lifelong activity. In adulthood, PL is expressed differently. A cross-sectional survey of personal training clients and qualitative interviews with high-level Serbian PTs indicate that adults rely heavily on psychosocial support, flexible coaching approaches and a mix of intrinsic and extrinsic motivating factors. Clients value relational qualities, professional dedication and the trainer's ability to individualise the process without unnecessary demands. Consistent with evidence that effort often precedes motivation, trainers reported that early, manageable successes are crucial for building confidence and adherence. The synthesis of the three studies highlights a fragmented developmental pathway and highlights the need for a lifespan-aligned approach to PL in Serbia, supported by curriculum reform, improved teacher preparation and strengthened professional development for PTs with the introduction of 'exercise literacy' concept.

Key words: Physical Education, personal training, behaviour change, motivation, autonomy support

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INTRODUCTION

Physical activity levels are declining across many countries, creating a global challenge for public health systems (Ramalho & Petrica, 2023). Modern lifestyles, increased sedentarism and reduced opportunities for spontaneous movement have highlighted the need for long term strategies that can support active living throughout the lifespan. Within this context, physical literacy (PL) has emerged as a guiding framework for understanding how individuals present the motivation, confidence, physical competence and knowledge needed to engage in meaningful physical activity across different stages of life (Bailey et al., 2023; IPLA, 2024; Carl et al., 2026). International bodies such as UNESCO and the WHO recognise PL as a foundation for lifelong health promotion (Carl et al., 2024), yet its integration into education and community practice remains a challenge (Bailey et al., 2023; Stoddart et al., 2023; Carl et al., 2025).

For children, Quality Physical Education (PE) is where PL is nurtured and promoted (McLennan & Thompson, 2015). However, Serbia is absent from many pan-European studies on PL and currently has no official PL-aligned association to promote or guide its integration into education and sport systems. PE in Serbia is shaped by a complex mix of educational traditions and cultural expectations, with a persistent focus on performance-driven methods influenced by the nation's long-standing sporting successes (Curovic et al., 2025). This national context may be restricting opportunities for teachers and pupils to adopt a wider holistic understanding of the factors associated with a sustainable engagement in recreational forms of physical activity (Cvetković et al., 2021; Curovic et al., 2025).

Parallel to this situation, adults in Serbia are experiencing rising inactivity and obesity levels (Serbian Association for the Obesity Examination, 2017; BBC, 2023). Although widely recognised that exercise and diet can improve health outcomes, motivating people to change their habits remains a complex and critical challenge (Maguire, 2001; Salas, 2015; Rand et al., 2017). Personal trainers (PTs) are essential in this process, as they can translate general advice into actionable plans and provide personalised socio-emotional support (Curovic & Grecic, 2023, 2025). PTs may be critical in promoting PL for adults via their influence which can extend beyond the individual client, helping create a "chain reaction" in which those inspired to adopt a healthier lifestyle and engage in exercise become sources of social support for others in their surrounding (Bélanger-Gravel et al., 2011; Annear et al., 2014; Rand et al., 2017). At the moment, however, personal training lacks the standardised regulations and mandatory certification found in many Western countries. This seems to have resulted in a fragmented and unregulated market for Serbian adults to navigate when searching for and accessing the support that they need (Curovic & Grecic, 2025).

These two worlds, childhood PE and adult exercise practice, remain globally disconnected (Curovic, 2025). The emphasis on sports activities and strong beliefs of children's internal motivation to move, are not transferable to adults given the time barriers and different psychological challenges that they face (Weed, 2017). Fitness-based activities with exercise as a central tool may be the most appropriate way to

support holistic development, improving mental health and helping Serbian citizens escape the inactivity epidemic (Thompson et al., 2020; Thompson, 2022). However, the transition period from school to adulthood seems to occur without providing a structured approach to help young people understand exercise, build independent skills and internalise the value of movement. This 'knowledge and practice gap' may reflect the absence of 'exercise literacy', a concept we recently introduced as a vital extension of PL (Curovic, 2025). 'Exercise Literacy' therefore stands for the knowledge, confidence and skills needed to self-direct and sustain exercise throughout adulthood.

The aim of this paper is to bring together empirical evidence from three related studies involving PE teachers, personal training clients and high-level PTs to investigate how the health and wellbeing of Serbian citizens may be enhanced by aligning to the PL concept and principles. As part of the ongoing worldwide PL debate, this paper combines conceptual insight about exercise literacy to explore what a unified lifespan framework for promoting physical activity in Serbia may look like in future.

MATERIALS AND METHODS

Overall design

This paper is based on a secondary analysis and synthesis of findings from three complementary studies conducted in Serbia:

1. a cross-sectional survey of 148 personal training clients,
2. a qualitative descriptive study of 12 high-level PTs, and
3. a qualitative study of pre-service (n=11) and in-service (n=20) PE teachers.

Each study was designed and analysed separately, then brought together in the present work to inform a lifespan framework for PL. All studies received institutional ethical approval and followed standard procedures for informed consent, anonymity and data protection.

Study 1: Personal training client survey

Design and participants

A cross-sectional explorative design was used to investigate clients' perceptions of exercising with a PT. The goal was to better understand clients' motivations, the most valued aspects of the service as well as perceived challenges. Participants were recruited from three highly respected personal fitness training centres in Belgrade, Serbia. Gym managers distributed an anonymous online survey link (Qualtrics) to current and former personal training clients. Inclusion criteria were age 18 years or older and at least one year of experience training with a Serbian PT. Participation was voluntary and anonymous.

Data collection

The questionnaire was available in Serbian and English and open for six weeks (23 October to 3 December 2023). It began with demographic questions, followed by two main sections: "Personal fitness training experience" and "Personal fitness trainer's features". In total, the survey included 20 items: 13 multiple choice questions, 4 Likert scale questions, 1 rank order question and 2 open ended questions. Multiple choice questions assessed valued aspects of personal training, while Likert and ranking items explored preferences, likes and dislikes. Open ended questions invited more detailed reflections on what clients appreciated in their PT and what they would like to change. The questionnaire was reviewed by both authors, refined through feedback and approved by the relevant ethics committee prior to distribution.

Data analysis

Survey data were exported to Excel for descriptive analysis. Frequency counts and percentages were calculated for all closed questions, and responses were grouped into categories to explore relationships between motivations, self-reported outcomes, valued PT qualities and perceived challenges. Likert scale responses were combined to rank the relative importance of different factors, with "very" ratings treated as the strongest indicator of preference, provided no major differences emerged when including "no" responses. Open ended responses from two items underwent simple thematic analysis with frequency counts to indicate the strength of opinion. Initial themes and classification were developed and then discussed and agreed upon with the second author.

Study 2: High-level personal trainers

Design and participants

The second study used a qualitative descriptive design guided by an interpretivist philosophy, with the aim of exploring the professional journeys, philosophies and practices of high-level PTs in Serbia. Twelve male PTs were recruited using snowball sampling informed by peer recommendations from highly respected fitness centres. Without a nationally recognised definition of expertise, "high level" status was preferred and defined using modified criteria: a minimum of ten years of professional experience, a stable and substantial client base, demonstrable client outcomes such as meaningful weight loss, and a reputation for strong care for clients' wellbeing as perceived by managers and colleagues.

Data collection

Data were collected through in depth semi structured interviews conducted in a quiet office setting by the authors. The interview guide comprised five thematic sections: 1) coaching philosophy, 2) trainer-client relationships, 3) objectives and

intentions, 4) practice methods, and 5) factors influencing professional development. Each section included core questions and follow up prompts to elicit detailed, reflective accounts (for example, “What is your overall coaching philosophy?”, “How has this changed over time?”, “Can you give an example from practice?”). Interviews were audio recorded, lasted between 20 and 60 minutes (mean 37 minutes) and were later transcribed and translated from Serbian to English.

Data analysis

Data were analysed using reflexive thematic analysis following Braun and Clarke’s six step process (Braun & Clarke, 2006). Both authors adopted an interpretivist stance, treating their own professional backgrounds as PTs and sport academics as resources for interpretation rather than biases to be removed. After familiarisation with the transcripts, initial codes were generated and organised into candidate themes. These were iteratively refined into six major themes and sixteen sub themes, which were then integrated into two higher order “storybook” themes describing how PTs become effective practitioners and how they work with clients. Themes were repeatedly checked against the full dataset and sense checked with external PTs to enhance coherence and credibility.

Study 3: Physical Education teachers and physical literacy

Design and participants

The third study explored Serbian pre-service and in-service PE teachers’ knowledge, beliefs and practices related to PL. A qualitative design with semi structured interviews was used, guided initially by a deductive analytical framework and underpinned by an interpretivist paradigm. Participants were 20 in-service PE teachers (12 elementary, 8 secondary) and 11 pre-service teachers. Purposeful sampling was used to capture a wide range of perspectives and experiences. In-service teachers were required to hold a PE degree and have at least five years of teaching experience. Pre-service teachers were in their final year of study or had graduated within one year and had completed their practical placements. Participants were recruited from four Serbian cities through the authors’ professional networks.

Data collection

Individual semi structured interviews were conducted face to face in Serbian. Guiding questions focused on teaching philosophy, understanding of PL, typical lesson structure, perceived aims of PE and desired teacher-student relationships. Follow-up questions invited concrete examples of practice and decision making. Interviews lasted between 35 and 55 minutes (mean 45 minutes), were audio recorded with consent, transcribed verbatim and translated into English. Each participant was anonymised and assigned a code (T1-T31).

Data analysis

Analysis was initially deductive, using the four core elements of the International Physical Literacy Association's definition of PL (motivation, confidence, physical competence and knowledge) as a priori coding categories. Transcripts were read repeatedly, and text segments were coded under the relevant elements using NVivo software. Within each element, patterns and recurring ideas were identified, leading to the development of sub themes. The research team engaged in iterative discussions, acting as "critical friends" to refine codes, challenge assumptions and consider alternative interpretations. Over time, the analysis took on a more interpretive character, allowing inductive insights to emerge within the deductive framework. As many accounts integrated multiple PL elements in practice, codes were reorganised into broader, holistic themes that more accurately reflected participants' lived experiences and the alignment or tension between their stated philosophies and reported classroom practices. Trustworthiness was addressed through reflexivity, transparency, investigator triangulation and rich description of the Serbian context in line with established qualitative quality criteria (Tracy, 2010).

Synthesis across studies

For the purposes of the present paper, the three datasets were not re-analysed but were brought together through a narrative, interpretive synthesis. Findings from each study were examined for points of convergence and divergence across the lifespan, focusing on: 1) how PL is understood and practiced in school PE, 2) how adults experience and evaluate personal training for health outcomes, and 3) how high level PTs describe effective practice and professional development. These insights were then integrated with our emerging concept of Exercise Literacy to construct a lifespan framework connecting childhood PL with adult exercise behaviour in the Serbian context.

RESULTS AND DISCUSSION

Physical literacy intentions in Physical Education versus classroom reality

Across the PE teacher study, both in-service and pre-service teachers described philosophies that aligned with PL, emphasising enjoyment, wellbeing, healthy habits and long-term engagement (Curovic et al., 2025). Most recognised the importance of fostering motivation, confidence and competence and could articulate aspects of PL conceptually. However, their descriptions of actual lessons revealed a strong reliance on traditional, performance-driven practice. Sessions were typically structured around drills and isolated technique repetition, with discipline prioritised over autonomy, creativity or self-directed learning. Opportunities for pupils to make meaningful decisions were minimal and often used as rewards rather than as planned learning strategies. As a result, PL-aligned intentions were not consistently reflected in practice.

This “intention–practice gap” suggests that although teachers value holistic development, the dominant teaching culture may be restricting pupils’ opportunities to develop the autonomy, confidence and agency required for lifelong physical activity. Consequently, many young people may leave school without the practical or psychological skills needed to sustain activity once PE is no longer compulsory (Cvetković et al., 2021). This is a common challenge globally as PL is valued by PE teachers (Houser & Kriellaars, 2023) but often framed as physical competence (Stoddart et al., 2023; Essiet et al., 2024; Yin et al., 2024) while other domains (which may have greater long term positive impact) often insufficiently addressed in practical terms (Cho et al., 2022).

Adults’ expectations of personal training and the need for holistic support

The personal training client survey showed that adults in Serbia seek PTs primarily for health-related goals, adherence support and behaviour change (Curovic & Grecic, 2023), with many objectives directly aligning with PL concepts (Carl et al., 2023). Clients valued: 1) professional guidance, 2) supportive trainer-client relationships, 3) goal-oriented planning, and 4) emotional encouragement. These factors were more important than technical expertise alone. Exercisers also identified significant challenges such as low motivation, difficulty adhering to nutrition plans and sustaining change independently. Some overweight participants reported limited improvements despite training, suggesting deeper behavioural barriers and a need for more individualised psychosocial support (Rand et al., 2017).

This suggests that many adults turn to PTs not simply for exercise instruction but to rebuild or strengthen PL aspects such as their confidence and motivation. Interestingly, in adulthood, these PL elements are expressed through a combination of intrinsic and extrinsic factors, where early success and structured effort increase motivation rather than the other way around (Campbell et al., 2025). This is fundamentally different from the childhood period where intrinsic motivating factors prevail (Yogman et al., 2018).

High-level personal trainer perspectives: one size does not fit all

High-level PTs described professional pathways that shifted from a narrow technical focus to a holistic, person-centred approach (Curovic & Grecic, 2025). They emphasised the need to understand clients’ lives, stress, emotions and barriers. They also reported that long-term success depended on building trust, fostering self-efficacy and helping clients experience early, achievable progress. Moreover, trainers highlighted gaps in their formal education, particularly in behaviour change, communication, psychology and practical coaching skills. Much of what they considered essential such as motivation strategies and how to adapt training to clients’ daily realities was learned informally through experience rather than through structured preparation.

Taken together, these findings suggest that high-level PTs are increasingly serving as PL agents for adults despite limited institutional support for this broader role. Therefore, it would seem critically important for future personal training professionals to learn more about how to nurture holistic approaches to clients, influencing their out-of-gym behaviours and sustained training practice (Tracey, 2008; Wayment & McDonald, 2017; Evensen, 2019; Carraça et al., 2021).

Exercise literacy as a critical bridge

The concept of Exercise Literacy offers a link between the sports activities and fitness based activities placed under the umbrella of PL (Curovic, 2025). As a part of the lifelong and life-wide PL journey, this refers to the ability to understand, plan and self-manage exercise across adulthood. In a fast-paced world with limited time and various barriers to participating in organised sport, exercise may be the most realistic route for sustaining activity (Weed, 2017; Thompson et al., 2020; Thompson, 2022). Currently, adolescents appear to receive limited preparation in how to engage in exercise independently. This creates a gap between the positive PL dispositions developed in school and the skills needed for adult exercise behaviour. Introducing exercise literacy in the later school years, therefore, looks essential. If systematically promoted, it could help young people build exercise competence and autonomy at a time when motivation for improving their appearance and self-esteem is naturally high, creating a foundation for future self-directed fitness journey (Curovic, 2025). As a result, the demand for traditional PTs in this rapidly evolving sedentary world may be reduced on the account of improved exercise literacy in Serbian populations. The personal training profession may need to evolve, cultivating a specialisation in PL to effectively support the sophisticated, individualised needs of the future's exercise-literate clientele.

CONCLUSION AND FUTURE PERSPECTIVES

Synthesis of the three studies shows a fragmented and complex picture of PL across the lifespan. One, however, that offers opportunities for lasting changes that can bring great health gains for the Serbian population. In summary, our studies have shown that 1) PE teachers hold PL-aligned values, yet practice remains dominated by traditional sport technique, limiting the development of autonomy and self-directed capabilities in youth; 2) Adults seek PTs to help them build confidence, structure, motivation and knowledge, elements that could have been strengthened earlier through PL-aligned PE and exercise literacy. This highlights a transactional relationship where clients assess the 'return on investment' from their efforts, necessitating highly individualised motivational strategies from PTs to demonstrate value; 3) High-level PTs increasingly deliver holistic, psychologically informed coaching, but their training does not formally prepare them for this responsibility, sending warning to how other PTs operate within the Serbian context, particularly as currently there is no officially recognised institution with clear criteria for accrediting PTs.

Adopting a more aligned PL lifespan approach in Serbia would therefore require: 1) aligning PE practice with PL principles and increasing student autonomy, 2) formally integrating exercise literacy into later stage PE lessons, and 3) enhancing PE education to enhance their ability regarding behaviour change, communication and psychosocial support. Such alignment would help ensure that the foundations that can be established in schools during childhood evolve smoothly into the skills required for active, autonomous adult lives. Critically, this approach must extend beyond schools and gyms, involving a broader ecosystem of PL agents. This includes greater collaboration with health and medical professionals and the integration of social prescribing, where general practitioners can formally recommend physical activity. Such a holistic alignment would help ensure that the foundations established in schools evolve smoothly into the skills and support networks required for active, autonomous adult lives.

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