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Physical Literacy of Physical Education Teachers and the Application of Physical Literacy Components During Physical Education Classes

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Abstract: This study emphasizes the importance of a teacher's adaptability in conveying knowledge and the varied interpretations of exercises among educators. While there is an evident difference in how physical education (PE) is approached, the common thread is the motivation and involvement of students. Promoting physical activity and forming associated habits at school has a major impact on a person's entire life. Students should learn these skills through PE classes led by physically literate teachers. The **aim** of this study was to determine PE teachers' physical literacy (PL), their understanding of the concept of PL, and the application of its components in PE classes. In the first phase of the research questionnaire survey of 81 PE teachers, the aim was to determine their physical literacy. In the second phase, observations were conducted to assess which components of PL teachers use during PE classes. In the third phase, a group interview was conducted to determine the opinions of PE teachers on the components of PL and its application. Teachers with a normal BMI and teaching higher grade students ($p < 0.05$) had significantly higher PL scores than those with a BMI that was too high ($p < 0.05$). Additionally, correlation analysis ($r = -0.247$, $p < 0.05$) showed that as BMI decreased, the PL score increased. Only two aspects of PL are developed during PE classes—competence and motivation. Very little or no elements of knowledge and understanding of physical activities and associated health benefits, and ways to reduce sedentary time and promote daily habits were observed. PE teachers' interviews revealed that they recognized PL as a holistic concept for the development of a person's physical abilities and knowledge. PE specialists also suggested teaching methods that could be applied outside of classes and acknowledged shared problems that reduce students' motivation to move and how to address them. This study highlights the complexity of the concept of PL and reveals many areas for future research: searching for a universal assessment of PL and focusing on the concept of promoting new, creative, less linear ways of assessing and teaching PL.

Keywords: movement; motivation; physical competence; physical education; physical literacy



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1. Introduction

Traditional physical education (PE) classes have historically emphasized the development of physical fitness, motor skills, and athletic performance. This focus often revolves around activities such as team sports, fitness tests, and drills aimed at improving specific physical abilities [1,2]. In recent years, the role of PE programs has expanded beyond mere physical activities and encompasses a comprehensive approach to fostering a healthy lifestyle, nurturing individuality and creativity, and encouraging communication and cooperation skills. Therefore, the purpose of PE is to develop physically literate individuals, and teachers play a key role in developing and promoting physical literacy [3]. The concept of physical literacy (PL) has gained prominence in recent years as a more comprehensive approach to movement education [3–6], especially when working with older students [7]. PL aims to educate individuals who are competent, confident, and motivated to participate

in a wide range of physical activities throughout their lives [8,9]. This holistic view goes beyond the mere development of physical skills and includes cognitive and affective components [3,10], and teachers play a large role in fostering students' PL [11]. The motivation to develop the concept of PL came from observations of tendencies such as a low range of participation in physical activities after graduation from high school [12], an overall increase in sedentary leisure activities [13,14], an increase in obesity and stress-related disorders [15], and a notable shift in PE toward professional sports, which has become the main accent of various physical activities [16,17].

Depending on everyone's ability, PL can be defined as the motivation, confidence, physical competence, and knowledge and understanding to be physically active in life [3]. The concept of PL was presented to move away from linear, simplistic, and reductionist ways of thinking [18]. Many PE programs cover topics that are similar to the elements of PL and increasingly focus on conceptual PE. Such an approach provides a basis for practicing healthy lifestyle habits throughout life (e.g., active living, proper nutrition) [19]. PE classes cover not only the training aspect but also other lifestyle elements. PE teachers recognize the importance of their behavior and attitudes toward health in shaping students' positive attitudes toward physical activity [20–22].

Although, for example, in Canada, physical literacy is widely used in education, research shows that a significant proportion of teachers still have little understanding of PL [22]. There is also much confusion about how teachers should integrate PL into their classes, as they themselves cannot precisely define the concept itself [21].

PL assessment and its relationship with PE are gaining increasing attention worldwide [10,21,23–25]. However, owing to the complexity of PLs, the development of a unified assessment system for PLs is a significant challenge (Green et al., 2018). This difficulty is partly related to the variability and individuality of PL development, the context-specific nature of some skills, and the importance of subjective factors such as confidence and motivation [23,24]. The complex nature of PL challenges the development of a unified assessment system, so creative, non-traditional methods of measuring/assessing PL are encouraged. There are several traditional, nontraditional, and creative methods and approaches for measuring and assessing PL: self-reporting tools [26], peer and teacher observations [27], project-based assessments [28,29], interviews and focus groups [30], play-based assessments [31], and different types of interventions [32,33]. A review by Jean de Dieu and Zhou [34] revealed that most studies assess one domain or a combination of two, whereas few studies assess the holistic nature of three domains (affective, cognitive, and physical) of PL. Each of these methods has strengths and limitations. It is often beneficial to use a multimethod approach, which employs several of the methods listed above, to obtain a more comprehensive assessment of PL.

Summarizing PL research is relevant. In particular, few studies have focused on this issue among PE teachers. Stoddart and Humbert [11], using quantitative and qualitative research design, analyzed how physical education teachers understand PL. Yıldızler and Munusturlar [35] explored how PL was perceived by physical education teachers and classroom teachers responsible for delivering physical education in primary schools. Chen et al. [36] measured four domains of PL (physical fitness, motor performance, daily physical activity, and knowledge and understanding of physical activity) among preservice physical education teachers. The findings indicate that PE teachers' PL, especially their knowledge, is low. Notably, qualitative investigations of lead PE teachers' understanding of PL [21] also suggest that even leaders have difficulty articulating conceptions of PL. Although these studies revealed interesting data, we still have limited knowledge about PE teachers' PL, understanding of PL, and especially how elements of PL could be applied in physical education. Notably, in Lithuania, PL research is very limited. Only a few studies were conducted with 7th–8th grade schoolchildren with the intention of investigating self-perceived PL [37] and primary schoolchildren PL [38], but there was no research with PE teachers.

With this in mind, the current study was initiated with the aim of determining the PL of PE teachers to explore their understanding of PL elements and to assess the application of PL elements during PE classes. In this study, we hypothesized that physical education teachers have little knowledge of the concept of PL and do not apply all the components of PL in their classes.

2. Materials and Methods

2.1. Study Design and Setting

In this research, both quantitative and qualitative methodologies were utilized. The qualitative part involved conducting observations and group interviews. For the quantitative part, we carried out a cross-sectional online survey targeting physical education teachers at a public school in Lithuania. According to the regulations set by the Minister of Education, Science and Sport of the Republic of Lithuania, only individuals with higher education are eligible to work as PE teachers in Lithuania [39]. The general PE curriculum [40] dictates the knowledge and skills that PE teachers need to instill in students. PE teachers, like other educators, can achieve different qualification levels: teacher, senior teacher, methodologist, and expert teacher. These qualifications vary not only based on the educator's experience but also on the extent of their organizational and pedagogical expertise. For instance, a senior teacher shares their best practices within their school, a methodologist extends their influence on the regional level, and an expert impacts the entire nation.

2.2. The Questionnaire Survey

Survey sample and procedures: PE teachers at various school grades were invited to participate in this study. The quantitative determination of the PL of PE teachers was carried out by sending anonymous questionnaires to PE teachers. Nonprobability volunteer sampling was used. Different methods were used to increase the sample size: sending e-mails or letters directly to PE teachers, contacting the school administration, and publishing information about the study on social networks. The PE teachers were informed of the purpose of the investigation, ensuring anonymity and data confidentiality. It was also emphasized that participation in this study was entirely voluntary and that participants could withdraw from it at any time. The total sample of the present study included 81 (70.4% female) PE teachers, aged 46.6 years ($M = 41.0$). More detailed characteristics of the survey of participants' social demographics (gender, age, BMI, school location, work experience, age of their students, experience related to high-level sports) are presented in Table 1.

In the first part of the survey, participants were requested to provide their height and weight details by answering the following questions: "What is your height without shoes (in cm)?" and "What is your weight without clothes and shoes (in kg)?" The Body Mass Index (BMI) was then determined by dividing the weight in kilograms by the square of the height in meters. BMI categories were defined as follows: underweight for BMI < 18.5, normal weight for BMI between 18.5 and 24.9, overweight for BMI from 25 to 29.9, and obesity for BMI equal to or greater than ≥ 30 [41].

Measure of physical literacy. The questionnaire was created on the basis of the following components of the PL [3]: daily physical activity habits, knowledge and understanding, motivation and confidence, and physical competence. The compilation of the PL score was based on the results of the questionnaire and was conducted according to the Canadian Assessment of Physical Literacy [42] methodology, which uses the score value assigned to each component. On this basis, the numbers of maximum points for each part are assigned, the sum of which is 100 points. Daily habits—30 points, knowledge and understanding—10 points, motivation—30 points, and physical competence—30 points. A similar PL assessment has been performed in sample of Lithuanian children [38]. Each of the parts was performed according to the Canadian Assessment of Physical Literacy recommendations [42].

1. Daily physical activity habits were assessed via the short form of the International PA Questionnaire [43,44]. The PA level of the participants was classified as low (LPA, <600 MET min/week), moderate (MPA, 600–3000 MET min/week), or vigorous (HPA, >3000 MET min/week) and for this part they were given PL scores of, respectively, vigorous PA (30 points), moderate PA (20 points), and low PA (10 points).
2. Knowledge and understanding (according to the recommendations of the World Health Organization): physical activity and sedentary behavior recommendations, physical activity, and understanding of physical literacy concepts. For this part, a questionnaire with 5 items was used (e.g., “How many minutes per week does the WHO recommend adults engage in moderate-intensity physical activity?”). The participants must define some definitions or choose the correct answer to the questions. The score was calculated as a sum of correct answers $\times$ 2.
3. Motivation and confidence were determined by the Locus of Causality for Exercise scale, which assesses a person’s autonomy to freely choose to engage in physical activity [45]. The scale involves statements to which participants respond on a Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Scale statement example: “I exercise because it makes me feel good”. The physical literacy motivation and confidence score (in a 30-point range) was calculated as follows: PL Score = ((raw score – maximum score)/(maximum score – minimum score))/30. Cronbach’s alpha coefficient for this scale was 0.80.
4. Physical competence was assessed via the subjective determination of physical abilities according to the Physical Self-Perception Profile questionnaire (Physical Self-Inventory–Very Short Form–PSI-VSF) [46,47]. This is an abbreviated version of the original Physical Self-Perception Profile (PSPP). The PSI-VSF is designed to provide a quick assessment of an individual’s physical self-concept via only 12 items. Each item represents a core aspect of physical self-perception, drawn from the broader subscales—2 items from each of the original 6 subscales. Each item is typically rated on a 5-point Likert scale (e.g., “I am confident in my athletic ability.”). The physical literacy physical competence part score (in a 30-point range) was calculated as follows: PL Score = (total PSI-VSF score/60) $\times$ 30. Cronbach’s alpha value for this scale was 0.94.

Table 1. Sample characteristics (N = 81).

Variables	Categories	N	%/M (SD)
Gender	Male	24	29.6
	Female	57	70.4
Age	Up to 35 years	12	14.8
	36–50 years	40	49.4
	From 51 years	29	35.8
Students’ grades (study years)	1–4 grades	11	13.6
	5–8 grades	31	38.3
	9–12 grades	39	48.1
Average work experience in the field of PE, years	up to 5 years	12	14.8
	6–10 years	8	9.9
	11–20 years	17	21.0
	More than 20 years	44	54.3
Teacher qualification	Teacher	19	23.5
	Senior teacher	22	27.2
	Methodologist	33	40.7
	Expert	7	8.6
Location of the school	City	66	81.5
	Rural area	15	18.5
BMI	underweight	4	4.9
	normal	42	51.9
	overweight	30	37.0
	obesity	5	6.2

Note: N: number of participants; %: percentage; Mean: mean; SD: standard deviation.

2.3. The Observation of Inclusion of PL Elements in PE Classes

The inclusion of PL elements in PE classes was observed in schools after prior coordination about visits with the teacher and the school administration. Schools were selected through convenient sampling, approaching schools and teachers who agreed and chose to observe students and teachers of all ages, including both males and females. The subject was informed about the purpose of this part of the study and the anonymity and confidentiality of the data. In total, eight physical education classes of eight different physical education teachers were observed. The observed PE classes varied between grades 1 and 6. The PE class observation protocol was developed following [3] the definition of PL-creating scales to assess each component (daily habits, knowledge and understanding, motivation, physical competence) while considering the nature and duration of PE classes. For the assessment of these components, questions and scales were created to assess each component. Daily habits consisted of 4 questions and 3 possible answers (A—does not encourage at all; B—slightly encourages; C—encourages a lot); knowledge and understanding was covered by 2 questions and the time frame allotted to them; motivation—2 questions with 3 possible answers (A—With praise; B—Discounts for what students have to do; C—Allowing students to do what they want); physical competence was covered by 3 questions with 3 possible answers (A—Never; B—Sometimes; C—Often). The features of the observed PL implementation in physical education classes were summarized from the obtained data.

Schoolchildren's parents were informed about this research part by sending information to them about the aim and nature of the research, i.e., that their children would be observed during physical education classes. All those who were not against participation in the research were included in this part. Before each observed physical education class, all the schoolchildren were again informed about the observations.

The PE class observation protocol covered all the PL components (daily habits, knowledge and understanding, motivation, and physical competence) with created scales to assess each while considering the nature and duration of the PE classes (Supplementary File S1).

2.4. Focus Group Interviews

Participants and procedures: A purposeful sampling method was employed to select participants who could provide varied and detailed insights into the understanding of PL elements. The teachers were invited for discussion when the schools were approached about completing the questionnaires and observing the classes, and at the same time, they were invited to participate in the discussion section. These invitations outlined the purpose and nature of the research, clarifying that their participation would involve a group discussion. Each prospective participant received detailed information about this study and its procedures individually. Those who agreed to participate were then informed of the interview's date and location. With the school administration's approval, focus group interviews took place on the school premises after working hours. Before starting the interviews, participants were reminded about this study's objectives, the process of recording and transcribing the discussions, and the data storage procedures. They were also informed of their right to withdraw from the research at any point. The number of participants in a focus group can vary from four to fifteen [48]; nevertheless, groups with a larger number of members are more difficult for the moderator to control [49]. In our study, three focus groups were conducted with teachers ($n = 4\text{--}5$ participants per group). A total of 15 PE teachers (7 male and 8 female) aged 47.6 years ($M = 48.2$) participated in this study.

Each focus group was facilitated by a moderator. The focus group interviews started with an introductory talk, once again explaining the nature of the debate, its aims, the rules of the discussion, the ethics of the conversation, and the participants. This introductory part also aimed to encourage the participants to feel and interact by asking questions and sharing their experience. All focus group discussions were audiotaped with the permission of the participants.

Interview guide. A semi structured question guide was prepared by the research team with the aim of exploring how PE teachers understand PL elements. The interviews included pre-structured questions with the same definitions (main components of PL) as those used by a group of PE specialists. The interviews were audio recorded with the permission of the respondents, and audio recordings of each group discussion were transcribed verbatim. A typical debrief entailed listening to each interview, ascertaining the quality of the information in terms of the process, and then transcribing it verbatim. The answers were analyzed via thematic analysis and divided into categories according to the components of the PL and subcategories according to the common ideas that emerged during the discussion.

The discussion consisted of defining the topic, promoting an open process, and including all participants. In the beginning, all participants shared their definition of the concept of PL, followed by a discussion about each component separately, thus allowing the emergence of essential themes in each part, which were then grouped together. This was followed by a summary, clarification of important points, arguments and ideas, and the conclusion of the session. The results from the interview questions for analysis were grouped into categories and subcategories concerning the understanding of PL: (1) Daily habits (difficulties; decisions during classes; solutions outside the classroom); (2) Knowledge and understanding (rules of games; explanations why; interdisciplinary education); (3) Motivation (students who are naturally motivated to learn; motivation based on incentives and discounts; motivation through strictness/discipline); and (4) Physical competence (teachers' competences; engagement of students; use of other tools).

Ensuring rigor of the focus group. Aiming to ensure the quality of the data, we applied various methods related to credibility, reliability, transferability, and confirmability. To enhance the credibility of the data, we used triangulation. In our study, triangulation took several forms. First, participants from different schools were included in group discussions. This allowed us to ensure that participants could share diverse experiences, which enriched the data. Second, observational methods were also employed, providing a more thorough examination of the research topic. Additionally, tactics were applied to ensure participants' honesty, such as ensuring their voluntary participation, assuring them that they could freely express their thoughts during the discussion without fear of losing credibility in the eyes of school administration, and guaranteeing confidentiality.

During the interviews, the moderator and an assistant participated in each focus group. In addition to the audio recorder, field notes were taken during the interviews. Afterward, the researchers immediately discussed the recorded field notes. Regular debriefings were organized to analyze each group discussion, and these meetings included a step-by-step review of the entire research process.

In qualitative research, it is important for researchers to be familiar with the context of the study. In our case, it was important not only to theoretically understand the concept of PL and be familiar with previous studies, but also to understand the current state of PE in the country. This helped ensure both the analysis of various documents regulating the education process in schools and the examination of teacher training practices. It is worth mentioning that the first and third authors of this study are directly involved in training future PE teachers and participate in their practical activities. Furthermore, to ensure the transferability of our data, we provided a detailed description of the current situation of PE in schools in Lithuania. This contextual information helps readers better understand both the current state of PE and the findings of our study.

2.5. Data Analysis

This study utilized both descriptive and inferential statistical methods to analyze the data collected from the questionnaire survey and classroom observations. For the data analyses, we used the IBM SPSS statistics 28.0 (IBM, Armonk, NY, USA). Cronbach's alpha (α) was used for reliability analysis of the questionnaire. The mean, standard deviation, and frequency percentages were calculated to summarize the key demographic and physical

literacy scores of the PE teachers. A Pearson correlation analysis was conducted to assess the relationship between PL scores and other variables. To compare PL scores across different sociodemographic groups (e.g., grade levels, and work experience), one-way ANOVA was conducted, and Tukey's post hoc test was used to reveal additional differences between groups. Additionally, for data analysis, we used effect sizes (η^2) to show the magnitude of group differences, helping to interpret practical significance as follows: $\eta^2 = 0.01$ indicates a small effect; $\eta^2 = 0.06$ indicates a medium effect; $\eta^2 = 0.14$ indicates a large effect [50].

3. Results

3.1. Physical Literacy of PE Teachers

The survey revealed that PE teachers' scores for PL ranged from 51.0 to 93.8 points on a 100-point scale, with a mean of 78.3 (SD = 9.02). We compared teachers' PL with other study variables (Table 2). One-way ANOVA revealed that there was a statistically significant difference in PL among the four BMI groups ($p < 0.05$). Tukey's test revealed that teachers with a normal BMI scored significantly higher than those with a BMI that was too high ($p < 0.05$). There was a statistically significant difference in the PL scores between the students' grades (study years) ($p < 0.05$). Tukey's test revealed that teachers teaching 9–12 grade schoolchildren had significantly higher PL scores than did those teaching students in lower grades ($p < 0.05$). The results revealed a negative correlation between the PL score and BMI ($r = -0.247$, $p < 0.05$), which showed that as BMI decreased, the PL score increased. A positive correlation between the classes of the students taught and the PL score was found ($r = 0.271$, $p < 0.05$).

Table 2. Physical literacy score values according to sociodemographic factors.

Variables		Mean (SD)	F Value	p Value	η^2
Overall average (min. 51.0, max. 93.8)		78.3 (9.0)			
Gender	Male	79.2 (7.8)	0.335	0.564	0.004
	Female	77.9 (9.5)			
Age	Up to 35 years	80.5 (9.9)	0.727	0.487	0.018
	36–50 years	78.6 (7.5)			
	From 50 years	76.9 (10.5)			
BMI	Underweight	72.55 (11.6)	2.919	0.022	0.102
	Normal	80.9 (7.8)			
	Overweight	75.6 (9.8)			
	Obesity	76.0 (6.4)			
Location of the school	City	77.8 (8.8)	1.088	0.300	0.014
	Rural area	80.4 (9.9)			
Students' grades (study years)	1–4 grades	72.8 (10.9)	3.216	0.046	0.076
	5–8 grades	77.6 (9.5)			
	9–12 grades	80.3 (7.5)			
Average work experience in the field of PE, years	up to 5 years	78.3 (10.7)	3.040	0.085	0.037
	6–10 years	79.8 (7.3)			
	11–20 years	77.9 (8.2)			
	More than 20 years	78.3 (9.4)			
Pedagogical qualification	Teacher	79.6 (9.3)	0.673	0.571	0.026
	Senior teacher	76.4 (9.9)			
	Methodologist	78.1 (8.9)			
	Expert	81.0 (5.9)			
Participation in high-level sports	Yes	77.9 (8.7)	0.167	0.684	0.002
	No	78.72 (9.4)			

Note: Mean: mean; SD: standard deviation; η^2 : eta-squared.

3.2. Implementation of PL During PE Classes

The inclusion of PL elements in PE classes was observed in eight different teacher PE classes. The PE class observation protocol covered all the PL components (daily habits,

knowledge and understanding, motivation, and physical competence) with created scales to assess each while considering the nature and duration of the PE classes (Table 3).

Table 3. Observational results of the inclusion of PL components in PE classes.

Teacher	1	2	3	4	5	6	7	8
1. DAILY HABITS OF PHYSICAL ACTIVITIES								
1.1 Does the teacher encourage daily PA habits?	A	B	A	B	A	A	B	B
A—does not encourage at all; B—slightly encourages; C—encourages a lot								
1.2 If yes, how do they do it?	–	–	–	saying how important it is not to miss a day	–	–	gives meaning	“move–ment snacks”
1.3 How much time is dedicated?	<2 min	2–5 min	<2 min	2–5 min	<2 min	<2 min	2–5 min	<5 min
1.4 Does the teacher offer ways for students to reduce sedentary time in their daily lives?	No	No	No	No	No	No	No	No
2. KNOWLEDGE AND UNDERSTANDING								
2.1 How much time does the teacher devote to theory about FA, recommendations, exercises, concepts?	<2 min	>5 min	<2 min	<2 min	2–5 min	<2 min	>5 min	2–5 min
2.2 What theoretical elements are taught?	A	A, C	A	A	A	A	A, C	C
A—explanation of concepts; B—PA recommendations; C—healthy lifestyle								
3. MOTIVATION								
3.1 How does the teacher motivate the students?	A, C	A	A	A, C	A	A, C	A, B, C	A, C
A—With praise; B—Discounts for what students have to do; C—Allowing students to do what they want								
3.2 Is only extrinsic or intrinsic motivation encouraged?	B	A	A	B	A	A	B	A
A—Extrinsic; B—Both								
4. PHYSICAL COMPETENCE								
4.1 Does the teacher show or just tell the name of the exercise?	A	A	A	A	A	A	A	A
A—Show; B—Just say the name								
4.2 Does the teacher explain the most important elements of correct execution of exercises?	B	C	C	B	C	B	C	B
A—Never; B—Sometimes; C—Often								
4.3 Do they engage in exercises with the students?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Daily habits. PE classes, which many students have three times a week, almost meet the physical activity requirements of students on those days, but on the rest of the weekdays, they are the responsibility of the students (or their parents). It has been noted that PE teachers focus on what is done during their classes, but there is close to nothing about what students could or should do in addition to being given some practical tasks to do after classes. Several teachers mentioned the importance of moving and becoming involved during classes, and they taught how important it is not to miss opportunities to be physically active. It does encourage less sedentary time, but none of the classes mentioned its harm or ways to reduce sedentary time.

Knowledge and understanding. The theoretical part is not a common part of PE classes. Only a few teachers included explanations of concepts, game rules, or the meaning of what was being done in their classes. Usually, it took less than 2 min, sometimes 2–5 min of class time.

Motivation. The most common way to motivate students is praise. Additionally, a couple of teachers, as a way of motivating the students, allowed them to participate in deciding the content of the classes—choosing what would be done or what games would be played. This freedom of choice was seen as the only way to promote intrinsic motivation. Teachers who included theoretical elements contributed to the promotion of extrinsic motivation.

Physical competence. Almost all the teachers demonstrated how to perform many of the exercises themselves, and some involved students demonstrating. Involvement in doing the exercises with the children varied—some teachers moved and played with the children, while others just showed. Differences were also observed in the interpretation of how to perform the exercises correctly—some teachers wanted the children to understand what was being done and encouraged independence, whereas others paid more attention to the

children being physically active and moving as much as possible during class, without necessarily knowing how to perform the exercises correctly.

3.3. PE Teachers' Perceptions of PL

Analysis of group discussions enables us to explore what PE teachers think about PL and how they understand the implementation of different PL elements in classes. Specifically, five themes and subthemes that emerged from the analysis of the group discussion are discussed below.

Teachers' opinions about the definition of physical literacy. PL is a complex and multifaceted concept that can be defined in various ways by different individuals and organizations. At the start of an interview group discussion, a group of teachers were asked to provide their own definitions of PL perception. Their responses revealed a diverse range of practical descriptions, with some participants having difficulty describing the concept or having a narrow understanding of it. One teacher defined physical literacy as "...general human knowledge about necessary physical activity (T1)", whereas another described it as "a certain base of knowledge" about exercise and movement" (T2). Other participants emphasized the importance of understanding the technique and reasons for exercising, as well as the impact of physical activity on life and movement—"you know the reasons why you are doing the exercises". Some definitions focus on the ability to use the body in different ways to achieve physical goals and the connections between physical activity and health. A passage illustrates the following: "...I use my body in as many different ways as possible to perform a certain task" (T5). One teacher highlighted the importance of coherence and awareness of a healthy lifestyle, including sleep, proper nutrition, and hydration: "...without sleep, eating properly, drinking water and taking care of your physiological body, nothing will happen" (T6). Moreover, teachers emphasized the variety of activities that PL encompasses and the realization that movement is a part of daily life. An example of this is the following: "...PL includes many activities, trying all kinds of games and sports" (T7). Overall, the interviews revealed a diverse range of definitions for PL, highlighting the multifaceted nature of the concept.

Encouragement of daily physical activity habits. The first theme revealed how teachers could promote/educate children's daily physical activity habits and included two subthemes: difficulties in making decisions during class and solutions outside the classroom.

The inclusion of the promotion of daily physical activity habits in PE classes is a complex process that was revealed in the discussion. One of the difficulties mentioned by the teachers was related to the size of the class, which made it difficult to manage it during the classes. A passage illustrates the following: "We still have little movement; studies are based on sitting, writing, large classes, difficult to manage" (T1). Other difficulties that emerged during the analysis related to the lack of interest of the students and thus the rapid fatigue of the students when performing specific tasks. An example of this is the following: "...children now want something completely different from what is in the programs; they are bored with everything" (T3), "They get tired of delving into a certain subject too quickly" (T3). Despite these challenges, teachers are trying to find solutions. First, during the interviews, it became clear how the teachers proposed developing (or encouraging?) the physical activity habits of students (or simply physical activity) at school. Teachers suggest organizing short breaks during classes, which can be used creatively to encourage physical activity (e.g., using music) Quote: "We have to do pedagogical breaks for primary school children" (T1). In addition, this can be done not only by directly creating conditions for students to be active during classes but also indirectly by talking with children and giving certain hints. A passage illustrating this is the following: "...we do this by subliminally inserting it into the classes, saying that, e.g., "I'm going to tennis practice tonight, what will you do, what sports do you do?" They themselves willingly talk about sports after school" (T3).

To develop certain habits, repetition is important. However, the purpose of repetition is not to do more but to develop the habit of doing the exercises correctly. A passage illustrating this is the following: "Habits need repetition. Another way to do this is to perform five basic exercises and try to make it a habit for the child to do it technically. I do not have a goal or

desire for him to do 50 pushups, but to do it technically. I'm trying to achieve this in repetition in order to create the habit of correct movement" (T4). In some cases, the habit could be created by the school itself: *"Our school has a daily plan in which, after class, you have to write down what you did, what you learned, what you could still learn and what you should improve. We encourage children and parents, if there is an opportunity, to come to school by bicycle, skateboard, scooter or on foot"* (T5). Thus, to develop physical activity habits, it is not enough to limit yourself to the school environment. Teachers encourage children to be physically active outside of school after school: *"suggest going to the forest on the weekend, maybe on a hill, or maybe some orienteering game. It is encouraged that physical activity itself becomes the norm to be active"* (T2). Teachers also recommend and highly appreciate the efforts of students to record their daily physical activity in diaries: *"I do not mind writing grades for the habit if the girls record their morning exercises, which they do, some for 3 min, some for 4 min, they write it in their diary. Such small steps make me much happier than some kind of victory or something like that"* (T6).

Knowledge and understanding. In this category, PE teachers detail their strategies for teaching physical literacy in the cognitive domain, and three subthemes are identified: rules of the games, explanations of the content, and interdisciplinary education. This includes using the rules of games to facilitate theory learning, integrating anatomy and practical examples such as heart rate monitoring for deeper understanding, and promoting interdisciplinary learning by connecting PE with subjects such as history and biology. Teachers use game rules as a key element of theory in PE, e.g., T3 uses game rule mistakes as learning opportunities, saying, *"I ask if they realized they made a mistake, what they did wrong. . ."* Similarly, T5 uses diagrams and muscle function explanations to enhance understanding: *"We give hints, try to explain logical things"*. Teachers ask questions to encourage students to think about the reasons behind certain exercises, helping them understand the practical application of theory in physical activities, e.g., *"I just ask questions during class: What is needed here? Who is good for you?"* (T2). Another way focuses on movement and practical applications such as heart rate monitoring or emphasizing repetitive learning: *"...the biggest learning happens when you teach yourself, I try to apply that."* (T4). PE teachers note the value of integrating other subjects, such as history and biology, to enrich students' understanding of PE, making it more engaging and relevant and fostering a deeper understanding of the human body and its capabilities. A passage illustrating this is the following: *"...When we think about the essential elements of anatomy, about the theory of evolution, we are studying a person"* (T8). This approach, along with discussion-based learning, aims to make theory more relatable and engaging and force students to think students differently: *"currently, fewer and fewer people have their own opinions, they are afraid to express it, because it is overshadowed from their school days"* (T5).

Motivation. The methods of motivating students in PE were categorized into three sub-categories: natural motivation, motivation through exchanges or discounts, and motivation through strictness/discipline. Motivating students is one of the most difficult tasks, but PE teachers use diverse strategies to engage students in physical activities, ranging from leveraging intrinsic motivation to implementing rewards and enforcing discipline. The natural motivation to move is more appropriate for young children's inherent desire to move, especially in a safe environment: *"kids are motivated to move because they still want to, especially when they feel safe"* (T1). Examples of external factors include children's natural inclination to move and the influence of physical heroes from popular culture such as Jackie Chan or Rambo. A passage illustrating this is the following: *"... in the past, there were many important heroes who were physically inspiring. . ."* (T3), but teachers noticed a reduction in this motivation; *"...it seems that now this is starting to be not so important"* (T8). Some teachers use incentives such as rewards for achieving certain fitness goals to motivate students, especially those in higher grades. Thus, in order *"...to persuade them I try it by suggesting that, e.g., 10 min, you try to do what I proposed; afterwards, for 10 min, I will let the whole class choose the game or activity they want"* (T3). Sometimes persuading students is not so easy because *"...we set goals and measure them together, they have to want it, not me"* (T6), but unfortunately, not all students understand that. Another method used by teachers,

discipline, involves treating physical activity with the same seriousness that other academic subjects emphasize and applying strict consequences for nonparticipation and setting strict participation rules. A passage illustrating this is the following: "...at school, we consider physical activity just as important as other subjects" (T5) or "...after a while they come and apologize for behaving badly" (T6). For some students, grades are used as motivation, with a focus on effort rather than skill or results. This is illustrated by the following quote: "...if you work, it does not matter the result or your technique; if I see you working, you will get that grade" (T4).

Physical competence. The last topic discussed in the interview group discussions was related to PE teachers' and other competences, which were classified into three subcategories: teachers' competences, the engagement of students, and the use of other tools. Most teachers recognize the importance of the PE teacher's personal physical competences, primarily emphasizing the PE teacher's personal physical abilities as a role model. A passage illustrating this is the following: "...yes, the teacher is a personal role model" (T4). Examples include teachers participating in activities with students and utilizing their own physical skills as motivators: "...it's much more interesting for students if you are playing with them together" (T5). Moreover, teachers encourage students to be actively involved in classes, such as using students with professional sports experience to teach parts of the class. A passage illustrating this is the following: "...I have three volleyball players who play professionally, even though they are seventh graders, but they probably play more technically than I do" (T3). Teachers' use of alternative methods and resources when direct physical participation is not possible is one way to engage students in class activities. An example of this is the following: "...it is impossible to be a master of everything; you need to know where you can get information from, who you can call to show you certain things" (T2). Additionally, alternative methods are mentioned when direct physical participation is not possible, such as inviting external experts or employing different teaching aids. Teachers agree that they need some additional help, especially when they are older; "...obviously, there is a limit to how long it works, especially when we teach younger people as we get older, there are days when we as teachers can no longer be in that showing role..." (T4).

4. Discussion

Modern pedagogical theories emphasize the need for teachers to adapt their methodologies on the basis of the changing dynamics of student populations and educational environments [51,52]. As numerous studies indicate [53–55], teachers' ability to modify their approach on the basis of student needs, technological advancements, and societal changes can greatly influence learning outcomes. In the context of PE, this adaptability becomes even more critical, given the diverse physical and emotional needs of students. This research focused on the importance of promoting physical activity and forming associated habits at school, emphasizing the role of physically literate teachers in ensuring that students acquire these skills during PE classes. The primary aim of this study was to explore PE teachers' physical literacy, understanding of the concept of PL and its application during class.

This study revealed that most PE teachers (49.4 percent) have good physical literacy scores (over 80 points out of 100). This study partly aligns with previous research showing that most PE teachers are well-educated in physical literacy understanding but may need further development in applying the concept consistently across all areas of physical education and especially drawing attention to the benefits of physical fitness and motor skills competence for physical education teachers as possible role models [56–58]. Chen with colleagues [36] found that some PE teachers in PL components show worse results than 12-year-old students. These differences can occur while different studies for PL assessments use different tools.

The relationship between physical literacy (PL) and Body Mass Index (BMI) observed in this study aligns with findings in previous research, which often demonstrates a positive association between higher physical literacy levels and healthier BMI ranges [56,58–60].

Specifically, studies have documented that greater engagement in physical activity, a core component of physical literacy, is typically associated with lower BMI and better overall health outcomes [36,37]. Such associations support our findings and provide a context for interpreting the negative correlation observed between PL scores and BMI in our sample. Similarly, perceived PL was associated with body composition in secondary school students [61]. Moreover, prior research has indicated that teachers with higher levels of physical literacy may serve as role models for students, potentially encouraging healthier habits and activity levels [3,11]. By reinforcing these connections between PL and BMI, our study contributes to a growing body of literature suggesting that promoting physical literacy among PE teachers could indirectly influence students' lifestyle choices and overall health. This contextual perspective not only strengthens our findings but also highlights the potential impact of physical literacy education on long-term physical well-being. Additionally, in our study, we estimated that teachers who teach older students have significantly higher PL scores than, e.g., primary school students do. As primary school teachers are often teachers of all subjects, including PE, they often have less expertise in this area [62–64], which may have influenced this result.

However, in recent years, the concept of PL has entered policy and practice in many countries and has become a significant focus of physical activity, PE, and sport promotion [10,25]. However, observations of PE classes revealed how difficult it is to include some components of PL in classes, especially the development of students' internal motivation and the encouragement of reducing sedentary time. This finding is in line with other studies that highlight the challenges of education in sustaining internal motivation [65] and sedentary behavior in schools [66] and integrate all PL components [67,68]. This finding shows that developing students' PL comprehensively requires not only a good understanding of PL and significant effort on the part of teachers but also new and creative teaching methods, as highlighted by [4]. According to Hardman's [1] global report on the state of PE, the quality of PE programs in schools continues to decline, with many curricula having limited impact on increasing physical activity among young people. Lundvall and Fröberg [69] noted that for this reason, curriculum revisions, a reorientation of learning perspectives, and a rethinking of perspectives on health and well-being are necessary. While trends shift, it is important to consider the increasing sedentary time of people, and to promote a healthier and more active society, the need for effective PE programs is increasing [67,68]. Scientists [10,70] note that physical literacy is an increasingly popular topic in PE and that the concept and ideas of PLs have the potential to resonate with the learning and lifestyles of the younger generation. As class observations have shown, some PL components are easier for teachers to incorporate into classes than others are, but the essence of the PL concept is a holistic approach to physical activity [9]. Moreover, scientists suggest [71,72] stronger inclusion of PL components in the PE curriculum, initial teacher education, and continuing professional development.

The teachers' discussion confirmed the teachers' low understanding of the concept of PL itself [22], even though the teachers had a broad understanding of the individual components of PL. PL researchers emphasize that it is a trait that develops throughout life, beginning in childhood and continuing into adulthood [73]. Therefore, the concept of PL is relevant for everyone, regardless of their age and abilities. PE teachers are responsible not only for their own but also for students' attitudes toward physical activity throughout their lives; thus, it is important that teachers know about various ways of promoting physical activity, willingly engage in activities with students, and ensure that students are interested [21,22,72]. This is associated with an individual's ongoing commitment to participating in physical activity [3].

In terms of daily habits, the discussion revealed how important it is not only to encourage students to become involved during PE classes but also to encourage them to engage in activities after classes. Students who engage in physical activity after school are less prone to depression and have more self-confidence [74]. The knowledge and understanding section revealed that teachers are not inclined to include theoretical elements

in PE classes. It is not a large part of the curriculum, and it is not discussed much in regard to PE. This could be another area that needs more attention in educational programs and norms, as the literature shows that students who have prior knowledge in a certain area of movement are much more likely to maintain interest for a longer period of time [75]. The physical competence of the PE teacher was highlighted in the discussion as a very important and influential part of effective classes and a way to increase students' motivation to engage in PE classes. Similarly, [76] reported that the development of subject knowledge and professional skills are essential components that define a PE teacher as "competent" and PE programs as "effective". The results revealed how many components make up the PL and what a complex and encompassing concept is. An analysis of each PL component revealed many themes in different fields that encouraged further discussion with PE practitioners and further research.

The strengths of this study include the novelty of the topic in Lithuania and the opportunity not only to investigate but also to encourage teachers to be interested in the concept of PL. The nature of the research allowed teachers to be widely introduced to the components of PL and encouraged a broader approach to PE and its possibilities. It also inspired them to look for new and comprehensive methods to develop physical activity. Our study is not without limitations. Although the quantitative study included a sufficient number of physical education teachers for such studies, the study sample was not representative of the entire population of physical education teachers in the country. Another limitation of this study related to the qualitative observation, as a small number of PE classes were observed, and only one per teacher. If more observations were made, increasingly diverse insights could have been discovered. Only those PE teachers who were active in their activities and interested in innovation participated in the discussion section, so the average attitudes of teachers did not differ. Physical literacy (PL) is complex to measure due to its multifaceted nature, requiring comprehensive quantitative and qualitative research across broader samples. Future research could explore the impact of educational programs that develop all aspects of PL, moving beyond specific sports to general movement principles applicable across disciplines. There is potential for expanding our understanding of physical education through insights from PE teachers, who can significantly influence curricula and promote lifelong physical activity by exemplifying active lifestyles.

5. Conclusions

This study highlights the critical role of PE teachers in fostering PL and underscores the need for a holistic approach to physical education. Our findings indicate that while PE teachers possess foundational physical literacy skills, there are notable gaps, especially in promoting daily PA habits and intrinsic motivation among students. To address these gaps, we recommend that PE teacher training programs integrate specific strategies for incorporating PL components, such as structured motivational techniques, hands-on physical competence development, and knowledge-building around healthy habits. Future research should focus on developing standardized PL assessment tools tailored for educators, which could enable a more consistent and comprehensive evaluation of PL in teaching practice. Additionally, longitudinal studies examining the impact of improved PL on students' health and lifestyle outcomes could further clarify the long-term benefits of embedding physical literacy in school curricula.

Practical applications include introducing ongoing professional development programs that emphasize the holistic nature of PL, equipping teachers to engage students not only physically but cognitively and affectively as well. Ultimately, enhancing PL education for PE teachers has the potential to inspire lifelong healthy habits in students, reducing sedentary behaviors and fostering a more active, health-conscious generation.

Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/educsci14121391/s1>, Supplementary File S1—Observation of Physical literacy components in PE classes protocol.

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