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Article

Schoolyard Affordances for Physical Activity: A Pilot Study in 6 Nordic–Baltic Countries

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Abstract: Environmental settings influence children's and adolescents' physical activity (PA) in neighborhoods and schoolyards. This study aimed to explore the main characteristics of schoolyards in six Nordic–Baltic countries, to document how those facilities provide affordances for PA in 7–18 year–old schoolchildren, and how the schoolyard meets children's preferences. One schoolyard was studied in each included country: Iceland, Norway, Finland, Lithuania, Latvia, and Estonia. The affordances, facilities, and equipment for PA in schoolyards were identified through orthophoto maps and standard registration forms. Children's preferences were collected through group interviews at each participating school. A common design of schoolyards across countries indicated mostly flat topography with sparse vegetation and green areas dominated by large traditional sport arenas such as a football field, areas suitable for ball games, and track and field activities. Green spaces and varied topography were more prominent in Nordic countries. Across nationalities, the responses from pupils regarding the schoolyard were similar: they liked it though they wished for more variety of activities to do during recess. National regulations/recommendations for schoolyard design differed across the countries, being more restricted to sport fields and sport-related activities in Latvia and Lithuania, while in Nordic countries, the recommendations focused more on versatile schoolyard design.

Keywords: schoolyard; design; affordances; physical activity; pupils



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1. Introduction

Participation in physical activity (PA) provides pupils significant physical and social health benefits for pupils including improved well-being and physical fitness [1,2]. However, globally, 80% of 13–15-year-old adolescents do not fulfil the recommended minimum level of 60 min of moderate to vigorous intensity PA per day [3,4]. As a majority of children and adolescents spend a large part of the day at school, promoting PA, well-being, and health in the education sector is named as one of the World Health Organization's priorities [2,5]. Organizing a school day by providing possibilities to develop motor skills is important as these skills have been found to be positively associated with student academic

achievement [6–9] and well-being [1,2]. In addition, motor competence may predict children's higher PA level in the future [10,11]. School days can offer a variety of opportunities to be active, such as physical education (PE) lessons, active breaks during lessons, active commuting to school, and physical activities during recess [12,13].

Since children find outdoor environments to be stimulating for physical activities [12–14], the schoolyard may play a crucial role in motivating pupils to be physically active. The schoolyard can be defined as an open space of the total school ground identified as the plot area excluding school buildings, parking places, and other occupied area. The schoolyard covers the open space with sport areas that are available for the pupils to play, socialize, and be physically active during recess and lessons [12,13,15,16]. Many studies stress the importance of schoolyard structure and variety in used materials in order to activate pupils physically and develop their motor skills [17–20]. Schoolyards that include space, topography, and vegetation have a positive effect on pupils' PA during recess [16,21–23], stimulate physically active play more than inbuilt environments [24], and increase the variety of games played by both genders at different ages [25]. Furthermore, versatile schoolyards seem to promote creativity and reduce stress symptoms among pupils [26]. Results from a review by Morton et al. [27] showed that lack of equipment was considered a barrier and enough space was considered important for promoting PA. Intervention studies have also provided some evidence that allocating space for team games, play equipment, playground markings, and physical structures may improve PA behavior in schoolyards among pupils [28]. Gibson's theory of affordances [29] explains how the physical environment can provide a context for human behavior and learning. Physical environments may afford possibilities that are linked to the specific environment. The affordances of an environment can be potential and/or actualized [29,30]. Potential affordances refer to all the possibilities that the environment offers (e.g., rocks can afford climbing, an open field may afford running, jumping, etc.). Actualized affordances are the possibilities that are used by children exemplified by children playing soccer in a soccer field, where the field affords appropriate environments for playing soccer.

Studies have focused on how schoolyards allow pupils to carry out physical activities [23,31–33], but the quality of schoolyard design, including landscape, space, facilities, and the affordances for PA, has been neglected in the current field of research. To the best of our knowledge, research on pupils' preferences for the design and movement affordances of the schoolyard is scarce. Therefore, the aim of the present pilot study was to explore and describe the main characteristics of six schoolyards in six Nordic–Baltic countries, potential affordances for PA in 7–18-year-old pupils, and how the schoolyards met the pupils' preferences. Although Nordic–Baltic countries have different landscapes and historical and cultural backgrounds, schoolyards in every country should support PA and motor skills, as well as respond to pupils' preferences. Additionally, international and national guidelines for schoolyard design seem to be scarce and focus mainly on security prescriptions but little on affordances for PA in schoolyards. Thus, national guidelines, policies, and school curricula concerning schoolyards in each of the included countries were also explored.

The following research questions (RQ) were studied:

RQ 1: What are the characteristics of the six Nordic–Baltic schoolyards: differences and similarities?

RQ 2: What are the affordances of the schoolyards for PA: differences and similarities?

RQ 3: How do pupils perceive their schoolyard and what are their preferences for PA during the school day?

RQ 4: What are the national regulations/recommendations for schoolyard design and PA in schoolyards in the six Nordic–Baltic countries?

2. Materials and Methods

2.1. Study Design

The current pilot study used mixed methods, including quantitative and qualitative approaches, and can be characterized as a case study [34]. The study examined schoolyards in six different Nordic–Baltic countries: Estonia, Finland, Iceland, Latvia, Lithuania, and Norway. One compulsory school (grades 1–12) in urban or suburban districts was selected from each country, e.g., selected state secondary school in each country by following the principles of convenience and availability.

2.2. Data Collection and Documentation

Data collection was performed in autumn 2018 by using geographical mapping methods, pupils' group interviews, and documentation on national policy regulations and recommendations.

2.2.1. Schoolyards Geographical Mapping

The schoolyard environments were mapped by applying a registration form for field registrations to identify the school ground areas, facilities, and the landscape characteristics around each school [35]. Google maps (<https://maps.google.no/maps> accessed on 6 April 2021) were used as the map source. Mapping results were processed by illustrator tools (Adobe, CorelDraw, Paint, etc.). Schoolyards and facilities for PA were described and identified through orthophoto maps (Google maps as source), standard registration forms for mapping schoolyard space, facilities, and affordances for functional use. The data from the mapping of schoolyards were analyzed and categorized into maps and tables. The size of the schoolyard area was obtained from the technical department of municipality or calculated directly from the orthophoto map. School buildings and parking areas were extracted from the schoolyard area.

2.2.2. Schoolyard Affordances Registration

Based on Gibson's theory of affordances [29], the potential affordances of the six schoolyards were described by applying the previously validated registration form for field observations [35], which was discussed among all research team members and tested on a pilot school setting during the workshop in Kaunas, Lithuania, in autumn 2017. In the context of mapping schoolyard affordances for PA, the registration was focused on potential affordances for PA in the schoolyard and included available materials and equipment for different activities (e.g., ballgames, jumping, biking, sledging, etc.) as well as activities provided by facilities and landscape design in the schoolyards like play activities, sport, and social games and activities. Based on these registrations, the schoolyards were assessed as to whether they had constructions, apparatus, and nature in the schoolyard that stimulate PA.

2.2.3. Pupil's Group Interviews

Pupils' preferences for schoolyard design and activities were identified through the interviews. Qualitative data collection [36] was performed by group interviews in selected groups at each school. In total, 85 pupils were interviewed (43 girls and 42 boys). The age range of interviewed pupils varied from 12 to 15 years old ($M = 13.6$) in different schools. The interviews were performed in groups of 2–6 pupils by trained interviewers [36]. From 3 to 5 focus interview groups were organized in each participating country. The invitations to participate in this research were sent to pupils' parents and included the information about the aim and nature of the research, i.e., that their children are invited to a group interview. All those who agreed to participate in the research were included in the focus groups. Before the focus group interview, participants were again informed about the aim, content of the study, the recording and transcription of interviews, and the storage of the study data. They were also reminded about the right to withdraw at any time.

The interview included pre-structured questions about the schoolyard and PA during school day. The questions were translated into the native language of each country and the interviews were performed during the school day. The results from the interview questions were grouped into five different categories concerning the schoolyard: (1) perceptions of their schoolyard, (2) what pupils like to do in their schoolyard, (3) how pupils use their schoolyard in different seasons, (4) pupils' wishes for their schoolyard, and (5) how pupils perceive time for PA.

The interview was audio recorded with permission from the respondents and their parents; the audio recording of each group discussion was transcribed verbatim. A typical debrief entailed listening to each interview, ascertaining the quality of the information in terms of the process, transcription into verbatim, and translation from local language to English. Pupils' answers were analyzed in English using thematic analysis and divided into the 5 different categories that constituted the results that were the basis for their perception of the schoolyard design and movement affordances.

2.2.4. National Policy Regulations and Recommendations Documents

Key documents covering policy, planning, and curriculum from each country were reviewed to determine and compare existing recommendations and regulations of schoolyard design [15,37–49]. The findings were grouped into four different categories concerning the schoolyard: (1) regulations and recommendations for schoolyard area, (2) for schoolyard equipment and facilities, (3) for safety, and (4) curricular policy for using outdoor arenas for play and learning.

2.3. Ethics

The study followed the Helsinki declaration and national guidelines concerning the ethical guidelines and legal requirements. The study was approved by the principals of schools, each pupil participated voluntarily, and informed consent was obtained from parents in advance.

3. Results

3.1. Characteristics of Six Nordic–Baltic Schoolyards: Differences and Similarities

Figure 1 presents the schoolyard mapping cases from each country. The total area of schoolyards varied between 2500 and 38,670 m², leaving a space of 18–96 m² per child. The schoolyards were generally characterized by the open space dominated by ballgame areas with artificial surfaces. Most of the schoolyards had green areas (trees, grass, bushes, etc.) and were mostly flat with the exception of Norway and Finland having rocks on the schoolyard and Norway having the greatest difference in altitude (Figure 1).

The six schoolyards had many similarities and differences described in Table 1 and separately in the text below.

Estonia, compulsory school (grades 1–9; 7–16 years old, 968 pupils). The school was located in an urban area in southern part of Estonia in the second biggest town of the country. The landscape was mainly flat with a low and long slope and some vegetation, such as trees and bushes around the sporting areas, natural grass, and an artificial surface. Part of the schoolyard ground was covered by sport fields (football, basketball, track and field) as well as with asphalt parking spaces. A big part of the school territory was surrounded by a fence. In the schoolyard, pupils also had possibilities for skateboarding, rollerblading, or scootering with their own equipment as well as BMX or bicycles and winter activities like skiing, skating, and sledging. In addition, there were also some fitness training machines. The schoolyard provided possibilities to develop main motor skills like running, jumping, throwing, and balancing.

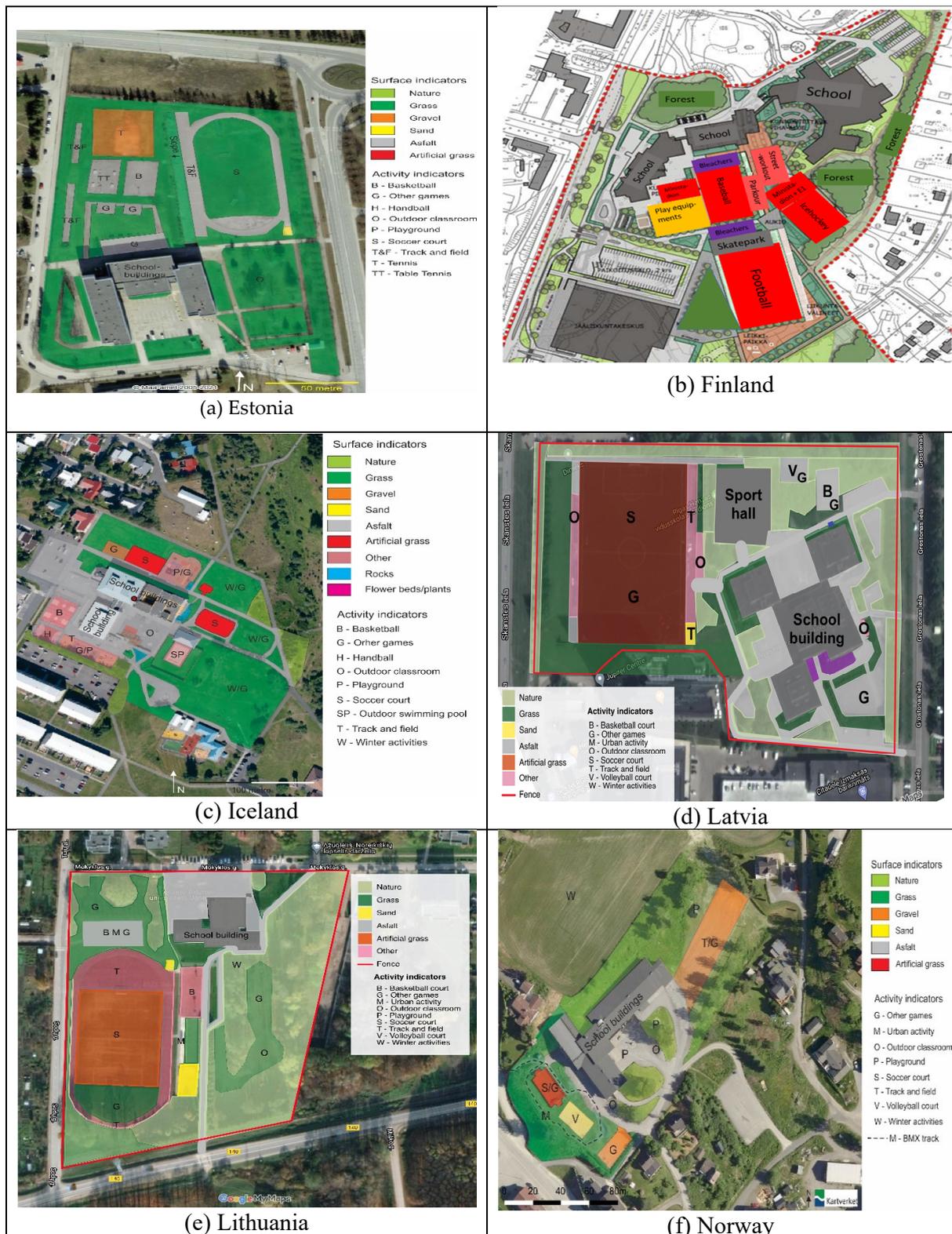


Figure 1. Schoolyards from different countries, i.e., (a) Estonia, (b) Finland, (c) Iceland, (d) Latvia, (e) Lithuania, (f) Norway, showing the characteristics of the design and facilities.

Table 1. Schoolyard characteristics in six compulsory schools in Nordic–Baltic countries.

Country and Grades (Pupils Age Range)	Schoolyard Area, Pupils (n), and Area/Child	Landscape: Topography and Vegetation	Surface	Dominating Main Characteristics
Estonia, Grades 1–9 (7–16 y)	28,257 m ² n = 968 29 m ²	Flat, open, dominated by sports fields, vegetation: grass and trees as borders Asphalt, sand, and gravel	Asphalt, sand grass	Different sports arenas for football, basketball; a little green area for smaller trees. Possibility to bike
Finland, Grades 1–9, (7–16 y)	33,400 m ² n = 950 35 m ²	Mostly flat Fields, rocks vegetation: forest, fields, planted flowers, bushes, trees, grass	Asphalt Sand and gravel Artificial grass	Ballgame areas Versatile equipment for motor skills and fitness Green area
Iceland, Grades 1–10 (7–14 y)	32,455 m ² n = 455 70.5 m ²	Mostly flat, smooth area, one hill that is popular in the wintertime. Planted trees, bushes	Grass, asphalt, artificial surface	Green schoolyard Diverse equipment for motor skills and physical fitness. Ballgame areas
Latvia, Grades 1–12 (7–18 y)	38,670 m ² n = 980 39.5 m ²	Flat, dominated by sports arena: soccer. Trees and bushes as fence and borders	Asphalt Artificial grass	Dominated by a big soccer field
Lithuania, Grades 1–12, (7–18 y)	35,000 m ² n = 1033 34 m ²	Mostly flat, lawns Vegetation: grass, bushes and trees	Asphalt, solid cover Artificial grass Sand	Green schoolyard—it is a part of the school territory with trees and bushes and timbers and some inbuilt sporting equipment Ballgame area Sandpit
Norway, Grades 8–10, (13–15 y)	2500 m ² n = 135 18.5 m ²	Undulated grass, trees bushes, rocks, forest, open land for all year activities	Asphalt, Sand and gravel Artificial grass	Green schoolyard with varied landscape and affordances related to seasons Ballgame areas, swing, BMX—trial

Finland, compulsory school (grades 1–9; 7–16 years old, 950 pupils). The school was located in a suburban area in a city in central Finland. The school and the schoolyard were renovated in 2017–2019. The schoolyard was flat with a small slope in the middle of the schoolyard. The schoolyard was mainly manmade: 20% asphalt, 25% artificial ground, 40% gravel, and 15% forest and vegetation. The schoolyard had a versatile sports environment: two mini stadiums mainly for basketball and football, two large ballgame fields mainly for Finnish baseball and football, and one small ballgame area which was used as an ice rink during wintertime. There was a frisbee golf court in the forest. There were versatile jungle gyms designed for pupils at different ages and special apparatuses for fitness training and parkour. These provided the possibility to develop motor skills such as balance, jumping, climbing, throwing, kicking, running, hanging, etc. There was an amphitheater with benches for social interaction. The schoolyard also had a spinning bicycle with electric pedals for charging a telephone. Balls and other equipment were available for the pupils to use during recess, and the whole schoolyard was open for the community in afternoons and on weekends. The school territory was not surrounded by a fence.

Iceland, compulsory school (grades 1–10, 6–16 years old, 455 pupils). The school was located in a suburban area of the capital. The total schoolyard for recess activity was 32,455 m² and the space per child 70.5 m². The landscape of the schoolyard was mostly flat, but it had one long hill. The surface consisted of grass with some bushes and trees, asphalt, and artificial surfaces. It included versatile sport fields, (i.e., two soccer fields, one with artificial grass and one with gravel), different courts for basketball and handball, and areas for games. The schoolyard included equipment designed for pupils at different ages for climbing, swinging, balance, and jumping. Special fitness apparatuses (“fitness track for strength and endurance”) were located on the schoolyard. Balls and other small equipment were available for the pupils during recess. The schoolyard had benches, a chess board, and areas for social activities. The biggest part of the schoolyard was manmade, and a planned area, but one part of it consisted of natural environment with trees and a small creek. The area was open for the public in the community to use after school hours and had no fence around it.

Latvia, compulsory school (grades 1–12, 7–18 years old, 1030 pupils). The school was located in an urban area in middle part of Latvia, in the capital. The schoolyard was 30,869 m² in area, leaving 29.98 m² in area per child. The school area was mainly flat and even. There were some small bumps, shrubs and trees, grass, and flower beds. Around the territory, there was a fence. In the territory, there were two areas for parking and no special playground equipment for elementary school children. Sports equipment was available for pupils, but they had to ask permission from teachers to use them. The school had a big football field with an artificial surface. There were asphalt-covered basketball and volleyball courts. The schoolyard offered a possibility for the pupils to run, jog, hang, climb, crawl, kick the ball, jump, leap, throw the ball, spin, step, stride, kneel, etc.

Lithuania, compulsory school (grades 1–12, 7–18 years old, 1033 pupils). The school was located in the central part of Lithuania, in a suburban area of the second biggest city in the country. The school territory was 35,000 m² in area with an average of 34 m² per pupil. The landscape of the schoolyard was mainly flat surrounded by grass, bushes, and trees. There was a small part of natural forest with vegetation and a low long slope. The inbuilt sport facilities included a stadium for track and field with sectors for throwing, long jump, and running, a soccer field with artificial grass, two courts for basketball (one with artificial surface, another having asphalt), one beach volleyball court, outdoor fitness training machines, an obstacle course, etc. The schoolyard was equipped to improve a variety of motor skills, i.e., stability, coordination, strength, speed, and endurance. Near the school building, there were several benches to be used for social interaction. The school territory was surrounded by a fence and the schoolyard was accessible for the community after school hours.

Norway, secondary school (grades 8–10, 13–15 years old, 135 pupils). The school was located in the southeastern part of Norway, in a suburban area in an agricultural district. It was a relatively new school from 2010 with modern design. The schoolyard was surrounded by the school covering an area of 2500 m² excluding school buildings, giving a space of 18.5 m² per child. The landscape was dominated by varied topography and vegetation of trees and bushes. The surface of the schoolyard was covered by asphalt around the buildings, sand, and gravel at open courts, with artificial grass in a ball bin. There was natural grass and trees in between the buildings and small hills with rocks and trees for climbing. A birds' nest swing was located on a small hill in the middle of the schoolyard. In front of the school building, there was an area for a BMX trail, a sand volleyball court, a ball bin, and table tennis. An amphitheater for outdoor events was located in the middle of the school area. The surrounding landscape like forest and open fields provided additional areas for steeplechase, orienteering, and winter activities like skiing and sledging. There was no fence around the schoolyard. The universal design was characterized by easy access around the buildings, but it was not especially designed for pupils with special needs. The schoolyard afforded landscape and facilities for multifunctional use with different seasons affording environmental responsive activities. In the summer, the open fields and courts afforded games and place-responsive functions. In the winter season, the fields were covered with snow and afforded snow activities such as skiing and sledging. Throughout the seasons, the pupils have an opportunity to develop place-responsive fundamental motor skills. General rules in Norway allow all community schoolyards to be used by the residential population after school hours.

3.2. Potential Affordances in the Schoolyards for Developing Motor Skills: Differences and Similarities

The Nordic schoolyards were typically designed with more varied topography and more vegetation, allowing, for example, winter activities. In most of the selected schools (except Latvia), there was enough space for playing different types of running games (e.g., tag games), throwing games (e.g., ultimate, baseball, rugby), fantasy games, and exploring activities. In the selected schools, only Norwegian and Finnish schools had an amphitheater for the imagination games and performances of the pupils. Outdoor lessons were conducted at the schoolyard in other subjects in addition to PE in Estonia, Norway, Finland, and Iceland. During wintertime, there were possibilities to do cross-country skiing and skating in Estonia, Finland, and Norway when the weather conditions allowed it.

All six selected schools in the study provided facilities and equipment for different recess activities such as jumping with a rope or a rubber band, hopscotching, and playing traditional, fantasy, and experiential games. Four out of six schoolyards had facilities for rollerblades and skateboarding. Dominating facilities in the studied schoolyards were sport fields for ballgames such as soccer and basketball. Additionally, some schoolyards in the study had fields for handball, volleyball, land-hockey, and softball. In the selected schools, pupils had to ask for the equipment or bring their own with the exception of the Finnish school, where the equipment was freely available for the pupils to use.

3.3. Pupils' Opinions and Preferences for Schoolyard Affordances and PA

The focus group interviews revealed pupils' opinions and preferences for schoolyard design and PA affordances. Specifically, five main themes were identified, which are described in subsections below.

3.3.1. Pupils' Perceptions of Their Schoolyard

Pupils' thoughts about their schoolyard indicated that most pupils liked their schoolyard. They highlighted the importance of the large outdoor area and many different possibilities for being physically active. The pupils from Estonia stressed the importance of the asphalt area in the schoolyard to ride bicycles. They also wanted a green area or a small park in the schoolyard. In addition to what was put forward by Estonian pupils, Lithuanian students mentioned, "I like trees. Nature, birds. I just like to observe". Some pupils

stressed that they liked when the sport areas were free to be used: *“it’s great when the court is free, and we can play basketball”* (Lithuania).

3.3.2. What Pupils Like to Do in Their Schoolyard

During the recess, pupils liked to play ballgames (*“we like the football fields because we like to play football”*, Iceland), climb, and just *“walk and talk”*—*“sometimes we “just like to chat. We meet with friends. We observe how children play”* (Lithuania). However, the results indicated some cultural differences between the Nordic and the two Baltic countries (Latvia and Lithuania), especially during the winter season, e.g., *“there is nothing to do in the winter. I’m in the yard only in the summer”* (Lithuania), versus *“We like the ball field and throwing snowballs”* (Norway) and *“we like to do gymnastics and tricks”* (Finland).

3.3.3. How Pupils Use Their Schoolyard in Different Seasons

In Nordic countries, *“snowball war”* and *“sliding”* were very popular among pupils. *“We do not use the equipment because we use the snow instead”* (Iceland). In addition to those in Nordic countries, Estonian pupils *“like to sledge and throw snowballs during winter months”*. Moreover, Estonian pupils like to use their bicycles in wintertime. On the other hand, the Latvian pupils said, *“we are not allowed to go outside during recess in the winter months”* (Latvia). Lithuanian pupils indicated differences in the season-related activities in their schoolyard: *“in the summer I enjoy playing and riding a bike. There is nothing to do in the winter. It is often wet and dirty in the winter.”*

3.3.4. Pupils’ Wishes for Their Schoolyard

The majority of the pupils in the studied countries did not have many wishes regarding the schoolyard facilities: *“Everything is there”* (Latvia/Lithuania). The most popular suggestion among pupils was to have a big trampoline and more possibilities for climbing. Pupils also wanted to have *“more benches”* in the schoolyard (Lithuania/ Norway/Finland) or *“do skateboarding”* (Lithuania). Some Estonian pupils wished to have a dancing area in the schoolyard and more facilities for fitness training (such as a bar for strength training) and more climbing possibilities (e.g., climbing wall, ladders).

3.3.5. How Pupils Perceive Time for PA

Most pupils considered themselves to be physically active during recess. In Norway, pupils wanted *“longer recess and more structured activities as well as an open gym”*. In Iceland, pupils said *“recess is the most enjoyable time of the school day. We want longer recesses, but not a longer school day”*. Lithuanian pupils noted that recess time is not enough for them to play outdoors between the lessons: *“breaks are too short for playing in the yard”*.

3.4. Regulations/Recommendations for Schoolyard Design in Six Nordic–Baltic Countries

The description of regulations/recommendations of schoolyard design is somewhat uncertain. According to a report on planning of outdoor environments for children and youth in the Nordic countries [37], there are no national regulations for schoolyard design in these countries. However, the outdoor environments are included in the national recommendations and guidelines for design of outdoor space in the Nordic countries [15,37,50]. The regulations for schoolyards exist in Latvia and Lithuania requiring inclusion of specific sport fields. In this study, due to the lack of consistency in existing regulations and recommendations for schoolyard design in the Nordic–Baltic countries, the term *“recommendations”* will generally be used to refer to norms, regulations, and recommendations.

3.4.1. Recommendations for Schoolyard Area

Recommendations for schoolyard size exist in most of the studied Nordic–Baltic countries except for Estonia, which has more general regulations determining that schools must have their own outdoor school area for safe learning. Finland has a recommendation for a schoolyard size of 5 m² per child and a minimum of total area of 500 m² excluding

sport areas [37,38]. Latvia has standards for sport areas: “The territory of the institution shall have at least the following functional areas: a sports area corresponding to the specific nature of the institution (sports field or stadium, premises or structures for the storage of sports inventory); If the sports areas cannot be established in the institution, the institution shall ensure that educators have the possibility to acquire the program of sports study subject” [39].

Lithuania: The size of a schoolyard depends on the number of pupils: the planned number of pupils is multiplied by 4 m² and 1200 m² is added. Sport fields and facilities within the school ground should be as follows: “schools planned for more than 1000 pupils shall be equipped with: not less than 3000 m² football field; not less than 800 m² universal course for track and field athletics and team sports (e.g., basketball, volleyball, other sports games) (hereinafter – universal course), running track. A plot of a school planned for up to 1000 students must be equipped with at least 2000 m² universal course. A football pitch, a universal pitch, a running track must be located on the side of the school building where there are no classrooms or classes” [40].

Iceland: The recommendations for design and construction of compulsory schools are the responsibility of the municipalities. Schools with 400–450 children, 25,000–28,000 m² of total space including buildings and parking are recommended [51]. The minimum possible schoolyard is considered around 2000 m² [50].

Norway: The design and construction of compulsory schools are the responsibility of the municipalities. Schools with less than 99 pupils should have a minimum total area of 3000 m², schools with 100–499 pupils should provide an area of 30 m² per child and at schools with more than 500 pupils, an additional area of 15 m² per child should be provided [15]. These recommendations are not systematically followed by the municipalities and schoolyard space is often related to the geographical location, whether urban or rural.

3.4.2. Recommendations for Schoolyard Equipment and Facilities

Availability of recommendations for equipment and facilities in the schoolyard varied typically across the Nordic–Baltic countries. Latvia and Lithuania seemed to have no or scarce recommendations for equipment and facilities, having the similar regulations for sport fields and facilities within the school ground concentrated on sport arenas as explained above. Estonia does not have any regulations on this yet.

Finland, Iceland, and Norway have a more pedagogical approach to recommendations for schoolyard equipment and facilities such as: —schoolyard should be stimulating, versatile and adaptable including materials, surfaces, shapes, vegetation, structures, built-in equipment’s, apparatus, etc. [15,38]. The schoolyard should have facilities to promote physical and mental wellbeing outdoors in contact with nature as well as physical activity and versatile motor skills providing positive experiences in being physically active [15,38]. The schoolyard should be a learning platform to increase emphasis on outdoor learning and organized to provide a variety of opportunities for games and other outdoor activities [41]. In addition to being an outdoor area for pupils, the schoolyard should be a neighborhood sport area for the community and clubs [15,38].

3.4.3. Regulations for Safety

Playground and sports equipment for children fall within the scope of the European Union’s General Product Safety Directive (2009/95/EC) [42] and European Standards for various products, such as playground equipment, and surfacing, floating leisure articles, and kick-scooters are developed. All the Baltic countries and Finland are members of the EU and consequently are obliged to follow the EU recommendations for playground safety. Moreover, Iceland and Norway follow EU regulations to ensure safety regulations for surface, fall pad, height, angles, and fences as well as security rules for equipment [43].

3.4.4. Curricular Policy for Using Outdoor Arenas for Play and Learning

All the participating countries (except for Estonia) have a curricular-based policy for being outdoors during school time. The Finnish curricular policy [44] emphasizes that recess-based outdoor activities should promote learning, well-being, healthy development, communality, vitality, and social skills, and recess is part of school day. Schools may decide themselves what kind of recess they have and at which part of the day. Latvian curricular recommendations [45] focus more on sport-related outdoor activities focusing on clothing and comparing outdoor–indoor qualities of well-being. The Lithuanian curricular policy recommends organizing as many lessons outdoors as possible [46].

All the studied countries have a national curricular policy. Only in the Nordic countries does the curricular policy point out that the schoolyard should have diversity in landscape and give children the possibilities to play freely, to teach them to reflect on their own nature experience, and to enjoy outdoor life in different seasons. Furthermore, the Nordic countries (Finland, Iceland, Norway) along with Lithuania recommend in their national curricular policy that the schoolyard should promote learning, activities for pupils' healthy development, social skills, and create conditions that encourage imagination and creativity [38,44,46–49].

4. Discussion

The aim of this study was to describe the main characteristics of selected schoolyards in six Nordic–Baltic countries and characterize the potential affordances for PA. The pupils' preferences for schoolyard design and facilities for PA were part of the study. The findings will be discussed under the subheadings in the same order as the four research questions.

4.1. Characteristics of the Selected Schoolyards

The main findings from the mapping, description of schoolyard design, and equipment indicated similarities and differences between the six schoolyards. The physical environments of the schoolyards were characterized by flat topography and surfaces covered by asphalt or concrete. The total area of the schoolyards ranged from 2500–38,670 m² providing a space of 18–96 m² per pupil. The open space was typically dominated by sport fields with artificial surfaces (see Figure 1 and Table 1). A Swedish study by Pagels et al. [21] indicated that large playfields and woodland areas demonstrated a significantly higher MVPA in the pupils during an outdoor time than the schoolyards with a smaller playground area. This may support the Norwegian recommendations for space per child to be at least 30 m² [15]. The three Nordic schoolyards were greener and more characterized by grass and forest vegetation as well as varied topography. The Norwegian schoolyard was characterized by a natural landscape and less artificial design. The Finnish schoolyard was the most versatile schoolyard providing standardized fields for different sports, playground areas, and natural landscapes with grassland and forest. Previous research findings have shown that natural environments support children's PA, especially in younger children [23,52–54]. Additionally, different studies have indicated that natural elements are important for self-initiated PA, creativity, and social and mental well-being [52,55,56]. Some studies confirm that children's preferences for natural settings have declined due to a lack of experience of natural places [57] and in contrast, other studies propose that school-aged children are still attracted to natural settings and adventurous physical activity facilities, given a choice of where to play [58–62]. In our study, the schoolyards and their facilities were also influenced by national sport domains, e.g., in Iceland with a handball court, Finland with a Finnish baseball court and an ice-hockey rink, and in Lithuania with basketball courts. The explanation for sport-specific schoolyard design could be that previously and up to date, PE has mainly focused on traditional sports [5,63].

4.2. Potential Affordances of Schoolyards for PA and Movement Skills

In our study, we perceived the six Baltic–Nordic schoolyards to be traditional, sport-related, and inviting mostly locomotor and object control activities. An outstanding

exception was the Finnish schoolyard with a multifunctional design and facilities that afforded a variety of physical activities customized for different ages and genders. Green schoolyards including parks and natural vegetation seemed to influence children's PA positively affording different and challenging landscapes for PA and motor skills and encourage stimulation and opportunities for creative and social activities [21,23,31,64–66].

Outdoor play in versatile schoolyards is considered an important contributor towards motor development as it provides diverse movement challenges that stimulate motor competence and motivation to engage in PA [67,68]. This is also confirmed by studies on preschool children [31,69]. In our study, we found the Finnish schoolyard to be the most versatile area for practicing activities such as parkour, outdoor fitness, and frisbee golf. In some schools, asphalt areas could facilitate activities with object control skills such as rollers and bicycles and BMX trial. Bars for balance walking and climbing walls were available in some schoolyards. Season-based activities such as skiing, skating, and sledging were organized in the three Nordic and one Baltic (Estonia) schoolyards (see Figure 1 and Table 1). Previous studies of schoolyard design have indicated that well-equipped schoolyards promoted intensity and variety of activity in schoolchildren's PA [25,70–72].

4.3. Pupils' Preferences for Physical Activities in the Schoolyards

Schoolyards can offer valuable opportunities for PA during recess [12,13,18]. Our finding indicated recess to be highly appreciated among pupils in the six schools. Most pupils in our study wanted longer recess, more frequent recess, and more affordances for multifunctional PA. A Danish study [73] found that many youths expressed that they would prefer to do activities outdoors during recess if there would be more versatile play facilities in the schoolyard.

Overall, the pupils in our study seemed to be satisfied with their schoolyards. However, they expressed interest in more untraditional activities, for example, a big trampoline and more possibilities for climbing, in addition to traditional ballgames. These perspectives are in line with the study by Pawlowski et al. [73] who found that more versatile play facilities in the schoolyards would inspire pupils to be more active outdoors during recess. The pupils in our study also expressed a need for more social meeting places in the schoolyards, for example, "walk and talk", and affordances that invite pupils for social activities as offered by "birds nest swing" and "low threshold". Furthermore, many researchers have claimed that the diversity of affordances for play in natural environments makes them more attractive to children [52,74,75] and provides more creative possibilities [76]. Recent studies focusing on the importance of multifunctional schoolyard design for increasing pupils' PA showed that better equipped schoolyards with green structures had a positive impact on increased PA [16,77,78].

Walking around in the schoolyard was expressed as a common recess behavior especially amongst adolescents. According to Fjørtoft et al. [79], this was a common activity among 14-year-old pupils in two secondary schools in Norway. Other studies also confirm pupils' preferences for schoolyards with different zones for action and silence, public and private, although these expressions differ in primary and secondary pupils as well as by gender [80]. One challenge for the future will be how to create more "active and social" meeting places in the schoolyard that can challenge the adolescent to be more active while encountering social activity. According to Parrish et al. [81], the school environment should provide potential opportunities to increase pupils' PA levels. Our study supports a wider understanding of versatile possibilities in the schoolyards that afford many different possibilities and challenges for PA and motor skills, which meet the different needs of different age groups [16,82]. This was verified by the pupils' interest in greater opportunities to be more physically active during the school day. Almers et al. [83] suggested that pupils should be involved in designing their schoolyard and have a say in planning the schoolyards for recess activities and outdoor learning.

4.4. National Regulations/Recommendations for Schoolyard Design and PA in Schoolyards in the Six Nordic–Baltic Countries

The regulation/recommendation framework differed significantly across the six countries. In Lithuania and Latvia, regulations appeared to be stricter, giving specific norms and rules for the design, content, and use of the schoolyards when compared to the other countries in the study. There were no regulations/recommendations in Estonia for the schoolyards in the perspective of fundamental movement skills or PA. The recommendations in the three Nordic countries provided guidelines for size as well as equipment and facilities, also emphasizing the value of green structures and natural environments being included in the schoolyards [15,21]. Such perspectives have been supported by former studies emphasizing positive contexts for children's health, well-being, and learning environment [72,84]. Curricular policy for using outdoor arenas for play and learning was expressed in all countries except for Estonia, which is starting to develop new perspectives for outdoor play and learning during recess [85]. The Nordic curricular policy for outdoor PA along with Lithuania more widely focused on the schoolyard being an outdoor arena in promoting PA and pupils' healthy development. Generally, the policy in Latvia and Lithuania was more rigid and supported more traditional sport-related instruction.

4.5. Strength and Limitations

The strength of the study was the novel approach used for systematic mapping and description of schoolyards and their affordances for PA and development of motor skills in the six Nordic–Baltic countries: Estonia, Finland, Iceland, Latvia, Lithuania, and Norway. The mapping of the schoolyards followed standard registration forms providing quantitative and illustrative information of the characteristics, facilities, and topography of the schoolyards. The interviews provided qualitative data on the pupils' preferences regarding their schoolyards. While studying schoolyards from six different countries can be seen as a strength of the study, the selection of only one school from each country can be regarded as a limitation. Moreover, the case schools were selected by convenience and availability, not by randomization. The study does not take into account the socio-economic or regional differences of the schools included. The schoolyards do not necessarily represent the common schoolyard of each studied country and, therefore, the results cannot be generalized. Another limitation is the small sample size of interviewed pupils. The selection of pupils was based on their interest in participation and on convenience, not randomization. This might have led to a selection bias. On the other hand, one of the purposes of this pilot study was to set an example and lead the way for potential future studies mapping numerous schoolyards and objectively measuring the PA level of pupils in schoolyards with different affordances, systematically observing what pupils do in schoolyards, and including more exhaustive interviews with pupils about their preferences concerning the design and use of the schoolyards.

4.6. Future Research Perspectives and Implications for Practice

Re-thinking the purpose of schoolyards and the value of the outdoor environment is important, as the free playtime for pupils has decreased in modern society in recent decades [86]. This study indicated the need for versatile schoolyards including natural and designed landscapes serving the demands of all pupils as well as traditional sport fields. As there are only a few studies in this field, our study paves way for future studies on schoolyard contexts. This study concentrated on describing the potential affordances of the schoolyards. In the future, the actualized affordances should also be studied by systematic observation how pupils use the schoolyard, for example, for developing motor skills or interacting with one another, and by the use of objective measures of PA during recess. More studies on the school environment and how it can afford PA may inform and inspire planners to elaborate and design schoolyard environments that stimulate more PA in the pupils. Future research should focus on schoolyard functionality and its meaning for the pupils considering the school culture, subjects, learning, PA, and fundamental

movement skills. Furthermore, the focus on the quality of schoolyards for outdoor PA and learning may influence policymakers, school administrators, and teachers to provide school environments and equipment that may increase pupils' PA and the development of their motor skills. Practically, teachers can collaborate with pupils to turn their schoolyards and natural environments into arenas that are innovative and supportive for the pupils' PA, motor development, and learning [87].

Despite the limitations of this study, our findings have some implications for research, policy, and practice. Planning and designing a schoolyard should be a participatory process including school culture, subjects, learning, PA, and motor skills and part of the total school development [80]. There is a strong need for cross-sectional collaboration between different experts such as landscape architects, PA experts, teachers, pupils, city planners, IT experts, parents, and children to develop multifunctional schoolyards for all—not only for the pupils during the school day but also for the community that may use the schoolyard after school hours. In a collaboration on the Nord-Plus project “Nordic Baltic Learning Environments for Movement Affordances” during the period of 2017–2021, the recommendations for schoolyard design [88] were compiled for free use by school communities, municipality authorities' policy makers, and other key stakeholders for the implementation of health-enhancing strategies for schools' outdoor facilities in order to increase PA in children. In addition, these recommendations may serve as an inspiration to (re)design the schoolyards' landscapes, accordingly addressing the needs of young people and boosting their physical literacy.

5. Conclusions

To the best of our knowledge, the current study is the first to explore and describe the characteristics of six schoolyards in the Nordic–Baltic countries. Although different in quality and design, we perceived the schoolyards to be mostly flat, traditionally built, and sport-oriented and inviting mostly locomotor and object control activities. An exception from this general impression of the schoolyards was the Finnish schoolyard, which was characterized as a multivariable schoolyard meeting most of the recommendations for functional schoolyard design. The examined schoolyards could be improved in order to meet the requirements for a multifunctional outdoor area and the needs of pupils. Across the studied schoolyards, the pupils wished for versatile schoolyards with facilities for more modern and exciting activities, but also places for privacy and social activities (e.g., “walk and talk”). National regulations and recommendations varied between the countries. The regulations were more strict, traditional, and sport-supportive in the Baltic countries compared to the Nordic countries, which focused more on multifunctionality in space and design.

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