Journal of Education and Learning; Vol. 13, No. 6; 2024
ISSN 1927-5250 E-ISSN 1927-5269
Published by Canadian Center of Science and Education

Factors Promoting Physical Activity and Physical Development in Early Childhood

Arphat Tiaotrakul[1]

[1] Faculty of Education, Naresuan University, Phitsanulok, Thailand

Correspondence: Arphat Tiaotrakul, Faculty of Education, Naresuan University, Phitsanulok, Thailand.

Received: March 14, 2024 Accepted: May 30, 2024 Online Published: October 22, 2024

doi:10.5539/jel.v13n6p306 URL: https://doi.org/10.5539/jel.v13n6p306

Abstract

This research explored factors promoting physical activity and development in early childhood in urban and rural areas. A sample of 488 urban and 387 rural students was selected through random sampling. Data was collected and analyzed using descriptive statistics and the chi-square test. The findings revealed that urban schools have more environmental factors promoting physical activity than rural schools. Urban students had better physical development scores than those in rural areas. The study also found that school location correlates with students' physical development in the form of good hygiene habits, consuming nutritious food and clean water, regular exercise, good body coordination, and good hand-eye coordination.

Keywords: physical activity, physical development, early childhood, urban and rural areas

1. Introduction

1.1 Background

In recent years the prevalence of suspected delayed development among young children in Thailand's educational system is believed to have increased from 2018 to 2021, rising from 21.2% to 27.8%, respectively (Early Childhood Development Policy Committee, 2021).The director of the National Institute for Child and Family Development at Mahidol University has discussed the situation in Thailand over the past 15 years, stating that approximately 30%, or 1 in 3 young children in the country have delayed development. This is a considerably high number. At least three reasons have led to this delayed development. First, malnutrition is a major factor. Second, problematic upbringing and problematic caretakers contribute to child development problems. This is especially true for nuclear households, which make up 30 % of Thailand's demography. Children from such small families are usually sent to daycare or are under a babysitter's care. The question lies in whether these caretaking agents have the capabilities to ensure good child development. Without proper play and care, development will be difficult. Thirdly, child development problems are caused to a large extent by smartphone and television exposure. Children under the age of 3 should not be exposed to these media. The child's main stimulation should be play that is appropriate to their age group (Tripathi, 2014).

Today early childhood physical inactivity is a growing concern, with profound implications for the health and development of young children. Research indicates that sedentary behavior among preschoolers is on the rise, linked to increased screen time and decreased outdoor play (Hu, Zheng, & Lu, 2021). This lack of physical activity can lead to a range of health problems, including childhood obesity, which has become a significant public health issue (Reilly et al., 2004). Moreover, early childhood physical inactivity can have lasting consequences, as it may set the stage for a lifelong pattern of sedentary behavior and associated health risks. It is essential to promote active play and physical activity in early childhood through strategies that involve caregivers, educators, and policymakers (Carson et al., 2017). Encouraging active play and limiting screen time can support childrens' physical well-being, and build a healthier future for the youngest generation.

Physical activity in early childhood is of paramount importance for the comprehensive development of children. Numerous studies have emphasized its positive impact on various aspects of a child's well-being. Regular physical activity fosters the development of motor skills, enhancing coordination and balance (Barnett et al., 2016). Additionally, it contributes to healthy muscle and bone development, reducing the risk of childhood obesity (Timmons et al., 2012). Furthermore, research suggests that physical activity positively influences cognitive development, including brain growth, improved focus, and stress reduction (Hillman et al., 2014; Fisher et al.,

2011). Active play encourages the development of essential skills like emotional regulation, cognitive processing, creative abilities, and social competence (Pellis et al., 2018; Polevoy, 2022). Early exposure to physical activity also establishes a foundation for lifelong health and fosters a lifelong appreciation for staying active (Telama et al., 2005). Consequently, it is imperative for caregivers and educators to prioritize physical activity in early childhood, since it plays a pivotal role in shaping a child's future well-being.

Early childhood education programs play a significant role in promoting physical activity and development. They often incorporate structured physical activities into their curricula, allowing children to engage in games, exercises, and outdoor play. These activities help children develop their gross and fine motor skills, coordination, and balance, which are essential for physical development. Variety in physical activities helps children develop different muscle groups, balance, and coordination. It also prevents boredom and burnout, making physical development a fun and exciting journey. Accessible play spaces are a crucial factor in promoting physical activity among young children. These spaces should be safe, stimulating, and designed to facilitate a wide range of physical activities. Parks, playgrounds, and recreational areas with age-appropriate equipment encourage children to run, climb, swing, and explore, fostering their physical development. Physical activity of at least moderate to vigorous intensity have been consistently favorably associated with multiple health indicators.

The current situation in Thailand has increased the need for early childhood education. This is due to current economic and social conditions, in which parents usually work full-time. This prompts the need to send children to school or daycare earlier than in the past. Organizing effective daycare centers or schools will help address some challenges including helping the family take proper care of a child when parents cannot. However, the current situation reveals that more than 50% of urban areas lack quality day care facilities, and most rural children are being cared for by their grandparents while parents are away for work. These challenges are significant contributors to developmental delays in children (Hangchaovanich, 2014). In addition, according to data collected by the Thai Health Promotion Foundation (2019), from a total of 2,148 local administrative organizations with a total population of 9 million people and 300,000 families, only 28% of young people lived with their parents, while 44% lived with their grandparents and 28% lived with other people.

The situation of educational inequality is rooted partly in the location of a child and their school. Children and youth in urban areas have easier access to education than those in rural areas, both in terms of distance and the quality of schools. Different environments have different impacts on children's eagerness and interest in education (Tumthong et al., 2014; Koomkhinam et al., 2016; Pharcharuen et al., 2021). All these factors that contribute to inequity in education are interrelated and correlated. Gaps between urban and rural areas result in education inequity and prompt employment issues as well as issues related to accessing public health services. It can be said that these gaps put those in urban areas at more advantage than those in rural areas (Sangmahamad, 2017; Thongpan, 2022). In addition, a study comparing the differences between schools in urban and non-urban areas found that there are disparities in terms of student characteristics, income, residence, school administrators, teachers, teaching and learning styles, and learning activities (Koompai, 2020).

Physical activity plays a pivotal role in the holistic development of children during their early years. It contributes not only to their physical health but also has a profound impact on their cognitive, social, and emotional well-being. The factors that promote physical activity and physical development in early childhood include active play versus sedentary behavior, the play environment, support for physical activity, physical activity education, and physical activity policy (The Division of Public Health, 2013).

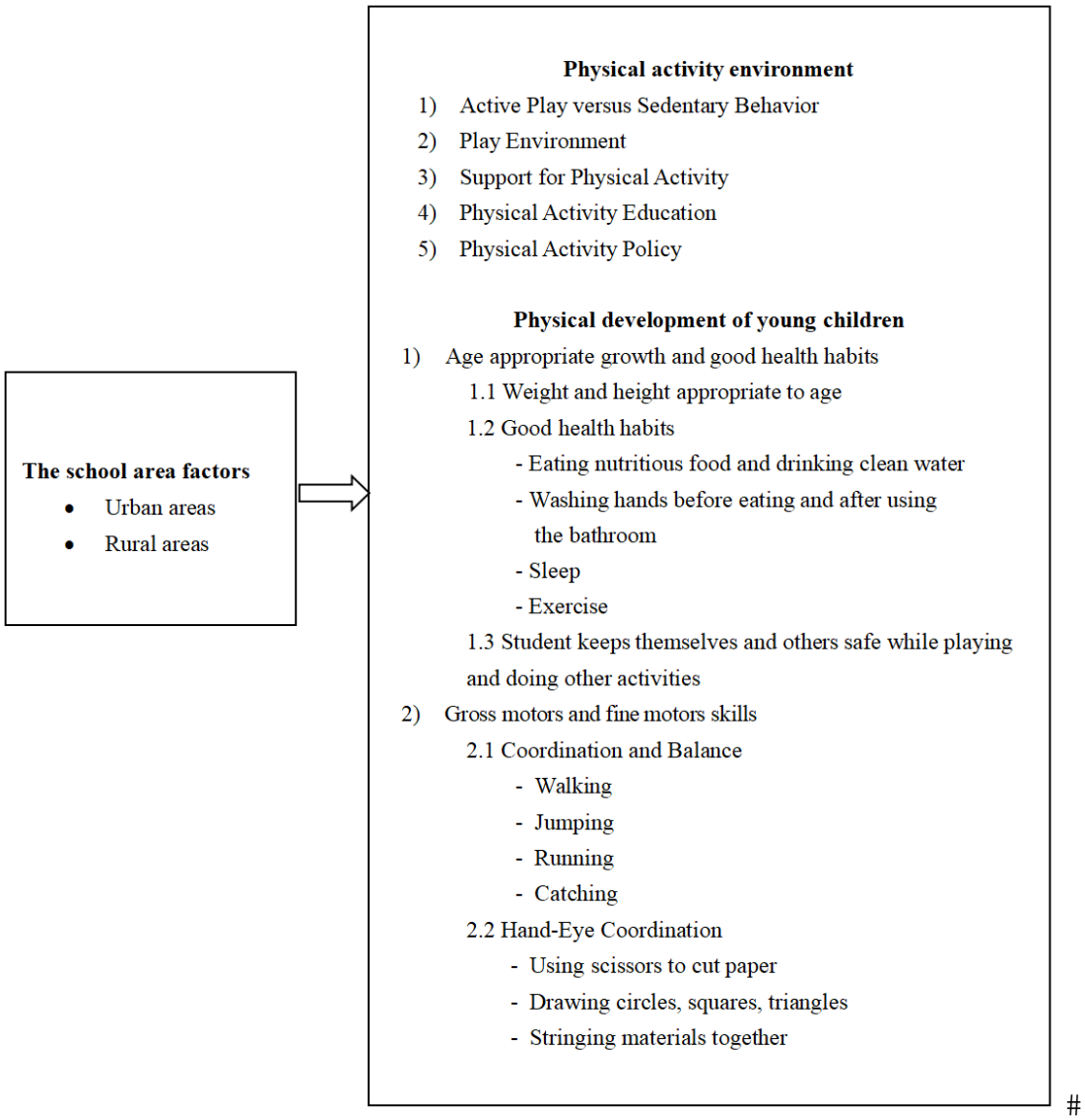
Early childhood learning happens primarily through play or physical activity. This involves the use of basic motor skills in play to learn and promote development. However, such processes can vary due to differences in location, environment, and disparities between schools and daycares in urban and rural areas. Inequity in physical activity prompted the current study to examine factors promoting physical activity and physical development of early childhood children in Phitsanulok. This study is designed to provide key concepts and guidelines that can be considered and adopted by agencies related to early childhood development such as the Primary Educational Service Area Office, the Child Development Center of the Local Administrative Organization, and schools in order to promote physical activity in early childhood.

Specifically, the purpose of this study was to study factors that promote physical activity and physical development in early childhood with a focus on factors related to location that affect the physical development of abilities of young children.

1.2 Hypotheses

Factors related to school location are associated with the physical development and abilities of young children.

School location is related to the physical development and abilities of young children.



#

Figure 1. A conceptual framework of this research. Students in urban areas will be compared with students in rural areas. The physical activity environment will investigated using the factors shown. Physical development will be evaluated using the factors shown. Data will be analyzed and recommendations will be made.

2. Method

This is an exploratory study to investigate factors promoting physical activity and physical development in young children. The research was carried out as described below.

2.1 Participant and Settings

The total population from which the research sample is taken is 24,028 young children age 3-6 in Phitsanulok Province (Central educational data warehouse system, 2021).

The sample group used in this study consisted of young children age 3–6 in Phitsanulok Province. The sample size was determined using the method of Yamane (1967), with the confidence level set at 95%, and the tolerance level set at 5%. The recommended sample size was 394 people. In order to prevent errors from participants providing incomplete information, an additional 25% was added to the recommended sample size. Finally there were 495 participants from urban areas and 495 participants from rural areas. Data was successfully collected from 488

participants in urban areas and 387 participants in rural areas, representing a data collection rate of 98.59% and 78.18%, respectively.

2.2 Research Instrument

Data collection was carried out using one survey consisting of two parts.

1) An assessment of factors promoting physical activity in early childhood, adapted from Physical Activity Environment Self-Assessment and Planning Toolkit for Childcare Settings (The Division of Public Health, 2013). This assessment covered active play versus sedentary behavior, play environment, support for physical activity, physical activity education, and physical activity policy.

2) An assessment of physical development in young children, according to the factors shown in Figure 1. This assessment was adapted from the Manual for Evaluating the Development of Students who have Completed the Early Childhood Education Curriculum (Office of the Basic Education Commission, 2018). It is an observational model based on indicators of physical development according to the desired conditions of young children as observed in the classroom by the student's teacher.

2.3 The Quality of Research Instruments

1) The quality of content validity was verified by 5 experts using the item-objective congruence method. The index value was 0.80. Both sets of tools were then revised following the experts' suggestions before a final consultation with teachers.

2) In order to check the clarity of the revised instrument and its messages, 8 teachers involved in the research were asked to review the revised instrument and confirm whether or not they correctly understood it. This included their understanding of the evaluation form explanation without external environmental factors and/or personal bias which could distort the message. The form was then revised again after receiving teacher feedback. Finally the instrument was put into use.

2.4 Data Collection

1) Approval was received from the director of each school in the study before data collection began.

2) Parent consent for each child was also received prior to the study.

3) Data collection was carried out by the researcher in collaboration with the classroom teacher normally responsible for each student. That teacher assessed the factors promoting physical activity in their student and recorded data on the physical development of their student.

2.5 Data Analysis

Data was analyzed using descriptive statistics to enumerate frequencies and find the percentage to explain information on environmental factors that promote the students' physical activity retrieved from the assessment and to study the physical development of the students. The researcher tested the hypothesis using the Chi-Square Test (χ^2 -test).

2.6 Ethical Considerations

This research study was approved by the Naresuan University Institutional Review Board (COA No. 030/2023 IRB No. P2-0442/2566).

3. Results

The results of the analysis of the factors promoting physical activity are shown in Table 1, and the results of the analysis of early childhood physical development are shown in Table 2.

Table 1. Comparative results of analysis of environmental factors that promote physical activity in young children attending schools in urban and rural areas of Phitsanulok Province

Factor	Urban areas	Rural areas
1. Active Play versus Sedentary Behavior		
1.1 Active play time	60 minutes or less per day	60 minutes or less per day
1.2 Outdoor active play	31–60 minutes per day	31–60 minutes per day
1.3 Screen time (including television, computer and video games)	1 hour or less per day	1 hour or less per day
2. Play Environment		
2.1 Fixed play equipment (tunnels, balancing equipment,	Yes	Yes

Factor	Urban areas		Rural areas
climbing equipment, overhead ladders, etc.)			
Wide variety of equipment	variety of equipment available and accommodates needs of all children	>	variety of equipment available but not enough
Suitability of equipment	Suitable for all children		Suitable for all children
Available and utilized	Fixed play equipment within walking distance is available and utilized		Fixed play equipment within walking distance is available and utilized
2.2 Portable play equipment (wheeled toys, balls, hoops, dancing ribbons, etc.)	Yes		Yes
Wide variety of equipment	Lots of variety	>	Little variety
Equipment are adequate	Adequate for children to use at the same time	>	Adequate but children must take turns
2.3 Outdoor play space	Available with plenty of open running spaces and a track/path/area for wheeled toys		Available with plenty of open running spaces and a track/path/area for wheeled toys
2.4 Organized activities to develop basic movement skills through independent play	4-5 times per week		4–5 times per week
2.5 Organized activities to develop basic movement skills through the guidance of adults	1 time per week	<	2–3 times per week
3. Support for Physical Activity			
3.1 During active play time staff	Often encourage children to be active and join other children in active play	>	Sometimes encourage children to be active and join other children in active play
3.2 Age appropriate physical activity media visibly displayed in common areas	No posters, pictures or books about physical activity displayed	<	A few posters, pictures or books about physical activity displayed in some areas
4. Physical Activity Education			
4.1 Staff are provided opportunities to participate in training related to physical activity (webinars, online courses, workshops, conferences, guest speakers, etc.)	2 times or more per year	>	1 time per year
4.2 Resources and information related to physical activity are available to staff (books, pamphlets, information guides, access to websites, etc.)			
1) Availablity of these resouces	Staff are encouraged to access these resources, and there are many available	>	Staff are encouraged to access these resources, but there are few available
2) Frequency of use	Often		Often
5. Physical Activity Policy			
5.*1* Policy status			
Active Play versus Sedentary Behavior	Written, available, followed and revised on an annual basis		Written, available, followed and revised on an annual basis
Play Environment	Written, available, followed and revised on an annual basis		Written, available, followed and revised on an annual basis
Support for Physical Activity	Written, available, followed and revised on an annual basis		Written, available, followed and revised on an annual basis
Physical Activity Education	Written, available, followed and revised on an annual basis	>	Written, but not always followed
5.*2* Ensure children get adequate playtime during inclement weather	Written, available, followed and revised on an annual basis	>	Exists informally, but it is not written or followed
5.*3* Support play activities, and the activies should not be used as a form of punishment	Written, available, followed and revised on an annual basis		Written, available, followed and revised on an annual basis
5.4 Physical activity experts supports sustainable physical activity	Yes / No	>	No

Table 1 shows that most schools in urban areas have more preferable environmental factors that promote physical activity for students than schools in rural areas.

Table 2. Comparative results of analysis of the physical development of young children attending schools in urban and rural areas in Phitsanulok Province, showing only results for inadequate development

Factors for evaluating physical development of young children	Urban area *(*total n = 48*8)* inadequate results		Rural area *(*total n = 387*)* inadequate		Chi-square
	Frequency (students)	Percentage	Frequency (students)	Percentage	
1. Age appropriate growth and good health habits					
1.1 Weight and height appropriate to age	35	7.17	29	7.49	0.033
1.2 Good health habits					
1.2.1 Eating nutritious food and drinking clean water	24	4.92	5	1.29	8.856*
1.2.2 Washing hands before eating and after using the bathroom	3	0.61	2	0.52	0.036
1.2.3 Sleep	3	0.61	12	3.10	7.917*
1.2.4 Exercise	0	0.00	1	1.55	7.618*
1.3 Student keeps themselves and others safe while playing and doing other activities	26	5.33	13	3.36	1.964
2. Gross motors and fine motors skills					
2.1 Coordination and balance					
2.1.1 Walking	49	10.04	33	8.53	0.582
2.1.2 Jumping	30	6.15	26	6.72	0.117
2.1.3 Running	22	4.51	30	7.75	4.063*
2.1.4 Catching	48	9.84	53	13.70	3.148
2.2 Hand-Eye coordination					
2.2.1 Using scissors to cut paper	48	9.84	56	14.47	4.436*
2.2.2 Drawing circles, squares, triangles	45	9.22	45	11.63	1.355
2.2.3 Stringing materials together	14	2.87	33	8.53	13.595*

Note. *statistically significant results.

Table 2 shows that the majority of young children in both areas had good results for age-appropriate physical development. For most of the factors assessed, urban areas had more desirable results than rural areas, but even in urban areas, some children's development lagged. Thus, there is room for improvement to ensure equal physical development regardless of school location**.** The factor in which the highest percentage of students lagged was hand-eye coordination when using scissors to cut paper. Specifically, in the urban areas, 9.84% of students could not pass this factor, while in the rural areas the percentage was 14.47%. The second most problematic factor was coordination and balance when catching. Specifically, in urban areas, 9.84% of students could not pass the catching factor, while in rural areas the percentage was 13.70%. The third most problematic factor was hand-eye coordination when drawing circles, squares, and triangles. In the urban settings, 9.22% did not pass this factor, while in the rural areas 11.63% did not pass.

Hypothesis testing results: The results of this study showed that six physical development indicators were statisitically significantly related to school location (urban or rural). Three of the significant indicators were in the category of Good Health Habits. These were: eating nutritious food/drinking clean water, sleep, and exercise. Another significant indicator was in the category of Coordination/Balance: running. The remaining two physical development indicators that were statistically significantly related to school location were in the category of Hand-Eye Coordination: using scissors to cut paper, and stringing materials together.

4. Discussion

This study compared urban and rural schools for young children in two areas: environmental factors that promote physical activity and physical development indicators in the children. Factors promoting physical activity in young children were divided into five areas: Active Play versus Sedentary Behavior, Play Environment, Support for Physical Activity, Physical Activity Education, and Physical Activity Policy. The findings revealed that schools in urban areas usually have more environmental factors encouraging physical activity for young children compared to schools in rural areas. This observation corresponds with the differences in physical development observed in this study between young children in urban and rural settings in Phitsanulok Province. Generally, children in urban areas exhibited better physical development indicators than their rural counterparts. Each of the five areas listed above is examined in more detail below.

In the area of active play versus sedentary behavior, it was observed that children in both urban and rural schools usually engage in 60 minutes or less of active play daily. During the school day they are allowed 31 to 60 minutes

of outdoor play and up to one hour of screen time per day. This short period of playtime is inadequate since optimal physical activity for children requires least 180 minutes of active play time per day, with a minimum of 120 minutes devoted to outdoor play. This observation is consistent with Usher (2018), who analyzed physical literacy programs for early childhood care (ages 3–5), a crucial period for establishing healthy behaviors and early development in areas such as Physical Literacy (PL), Social and Emotional Wellbeing (SEWB), and Cognitive Skills (CS).

In the category of the play environment, it was observed that most urban schools had various types of fixed play equipment, meeting the needs more effectively than in rural areas. Rural schools, while having a variety of equipment, often did not have enough. For example, urban schools usually had a sufficient variety of portable play equipment, allowing multiple children to use them simultaneously, which was more than what was available in rural schools. On the other hand, activities designed to develop fundamental movement skills through adult leadership were more frequent in rural areas, typically held 2–3 times a week, compared to once a week in urban areas. These factors significantly influence the physical development of young children. This observation is in line with Choomai (2016), who discussed the growth and development of young children, emphasizing that environmental factors are a crucial external influence on the development and growth of children, either positively or negatively. These factors are divided into two types: physical and social environments. The same environment may affect each child differently due to individual variations in children's perceptions and responses to various stimuli. Similarly, Dynia et al. (2018) conducted an empirical study on the environmental dimensions of physical literacy in early childhood classrooms. They found that the environmental components of the classroom were diverse, with literacy-related materials playing a significant role. The physical literacy environment in early childhood classrooms is a multidimensional construct that considers both the variety and the functional use of materials by children.

Regarding support for physical activity, the current study found that teachers' behavior during play differs significantly between urban and rural areas. Most teachers in urban areas encourage children to be more active and engage in play regularly, which may contribute to the more desirable physical development observed in urban young children compared to their rural counterparts. This finding is consistent with Tripathi (2014), who discussed factors affecting child development and the potential for developmental delays. One crucial factor is the quality of the child development process in daycare and play environments that stimulate all the senses. This is also supported by the research of Mueanprasan and Suggaravetsiri (2018), who studied social factors related to delayed development of curiosity in early childhood. They highlighted the importance of child caretakers having adequate knowledge and being encouraged to focus on early childhood development, which significantly influences appropriate future development in children.

Looking at the physical activity education, this study again found that there were differences between urban and rural areas. In urban areas, most teachers had the opportunity to participate in physical activity-related training two or more times each year, while teachers in rural areas on average had only one such opportunity. Also, teachers in most urban areas are encouraged to access learning resources and they receive plentiful support in this regard. In contrast, teachers in rural areas have relatively limited such resources. These factors affect the physical development of young children. This is consistent with Dinham and Williams (2019) who studied teachers' preparation for developing children's physical literacy. Their study asked the question: "How prepared are preschool teachers to implement programs that contribute to the development of children's physical literacy?" That study found that preschool teachers were generally well-informed, committed, and confident. But they have limited practical diagnostic skills. To effectively develop children's physical literacy, Hernaiz-Sánchez et al. (2021) studied physical literacy and teacher training. This is because physical literacy is considered a new approach to physical education that has emerged with the goal of promoting lifelong physical activity.

Physical activity policy in most urban areas is written, available, followed, and revised on an annual basis. In most rural areas, they are also written, but not always followed. These factors affect the physical development of young children. This is consistent with a study by Basoglu (2018) in which the importance of physical literacy for physical education and recreation was discussed. Physical literacy is related to the field of physical education and recreation. The study suggests that physical education curriculum should involve physical literacy and basic movement skills. Physical literacy is a very important goal of physical education. Developing an understanding of physical literacy helps understand the nature of physical education. The concept of physical literacy includes not only teaching children and youth to play sports or searching for people who have the ability to be an elite athletes. Rather, physical literacy is also about supporting children, students, youth and all citizens to be lifelong participants in physical activity. Physical inactivity is associated with several chronic health problems and adversely affects social life. This is particular true in today's school-age children who are raised with technological equipment, using

computers and mobile phones with limited physical movement. Because of this, there is an increased chance of childhood obesity. This situation makes knowledge and teaching of physical intelligence at the kindergarten and primary level crucial.

Turning now to this study's comparison of the physical development of young children studying in urban and rural areas in Phitsanulok Province, the results showed that, in general, young children in both urban and rural areas had physical development appropriate to their age. However, children in the urban areas were more likely to develop desirable characteristics than their counterparts in the rural areas. Physical development of students was also not uniform. The areas in which both urban and rural students had the most trouble in were Hand-Eye Coordination and Coordination/Balance, especially among rural students. This might be because urban areas have more environmental factors that promote early childhood physical activity than rural areas. This is consistent with Choomai (2016) who discussed how children who receive age-appropriate developmental promotion, were raised in the right environment, and received complete nutrition would show better development. If children at this age have developmental delays, this can potentially even affect the development of the next generation. But if developmentally delayed children receive encouragement and timely support, they should be able to return to their proper development. The results of a study by Altun (2019) demonstrates the effectiveness of cognitive games and physical games in enhancing visual perception and attention. This is consistent with the concept discussed by Tontipalacheewa (2008) who said that promoting hand and finger muscles in children is very important. Since children need to be able to use their hands in order to carrying out important activities, a play environment should be promoted. This is because play activities in various forms will help develop children's basic muscle skills to a level of agility appropriate for their age. Padan (2014) mentions ways to promote the ability to use small muscles, namely organizing art activities such as drawing and painting, cutting, tearing, crumpling, creating scraps to create stringing materials. These are all activities that promote the ability to use small muscles more efficiently. In addition, the Office of the Education Council (2018) provides competency-based early childhood development recommendations that allow children to use their strength and coordinate the work of their muscles. Children should be encouraged to engage in exercise, for example walking, running, jumping, climbing, playing actively with toys, playing with a ball, and bicycling. Children should be given the opportunity to participate or help with physical work. Children should also be trained to build movement and balance skills though activities such as cup stilt walking, frog jumping, walking on tiptoe, general jumping, jumping rope, Conga Line dancing, musical chairs, general running around, three-legged racing, and riding a stick horse. Children should be engage in play activities in which their bodies move in alternating directions. This is consistent with Keawkungwal (2010), who mentioned the importance of play in childhood. It helps children to understand themselves, understand their friends, and understand the feelings that others have towards them and the feelings that they have towards others. When young children start school, meet friends at school, are exposed to different kinds of people, and cultivate strong emotional and social skills, they are better equipped to navigate life's challenges and pursue their goals. However, many children have problems socializing with friends, for example they might not knowing how to share or they might resort to using violence, partly because of a lack of age-appropriate development that provides such skills. This is why it is important to prepare children to grow and develop properly, by giving them opportunities to play according to their own interests and with a variety of skill-building toys (McFarland, 2011).

5. Suggestions

5.1 Suggestions for Teachers

1) Teachers are encouraged to take care of children's health, hygiene, and good habits to in order to facilitate their complete development in terms of food, rest, and exercise.

2) Teachers are encouraged to promote activities that help develop young children's physical abilities in hand-eye coordination and the ability to move the body fluently. All activities that support coordination and balance are helpful.

3) Teachers are encouraged to regularly join and engage with children during play. This is because the teacher's engagement stimulates children's awareness and encourages physical activity.

4) Teachers are encouraged to organize a wide variety of activities that can promote holistic development in children so that they develop appropriately for their age and prepared to develop further.

5) Administrators and related agencies are encouraged to provide plentiful support to promote the development of children in rural areas.

5.2 Suggestions for Research

1) It would be good to develop a project for teachers of young children in rural areas to provide the teachers with

training on how they can design learning activities that will promote activity and physical development of their students in rural areas.

2) It would be good to research and develop physical activity programs for young children that can reduce the disparity between children in urban and rural areas.

6. Conclusion

To promote healthy, full development in young children, teachers should focus on health, hygiene, and good habits in their students, promote activities that develop physical abilities, engage with children in play, organize various learning activities, and provide more support for children in rural areas. Additional future research would be useful to train teachers in rural areas how to design learning activities that will promote activity and physical development of their students in rural schools. Future research would also be useful to develop physical activity programs for young children that can reduce the disparity between children in urban and rural areas.

Acknowledgments

Not applicable.

Authors contributions

Not applicable.

Funding

Not applicable.

Competing interests

Not applicable.

Informed consent

Obtained.

Ethics approval

The Publication Ethics Committee of the Canadian Center of Science and Education.

The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Provenance and peer review

Not commissioned; externally double-blind peer reviewed.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

References

Altun, M. (2019). The effects of mind games and games containing physical activity on attention and visual perception levels of primary school students. *Journal of Education and Learning*, *8*(6), 72–82. https://doi.org/10.5539/jel.v8n6p72

Barnett, L. M., Lai, S. K., Veldman, S. L. C., Hardy, L. L., Cliff, D. P., Morgan, P. J., … Okely, A. D. (2016). Correlates of Gross Motor Competence in Children and Adolescents: A Systematic Review and Meta-Analysis. *Sports Medicine* (Auckland, N.Z.), *46*(11), 1663–1688. https://doi.org/10.1007/s40279-016-0495-z

Basoglu, U. D. (2018). The Importance of Physical Literacy for Physical Education and Recreation. *Journal of Education and Training Studies*, *6*(4), 139–142. https://doi.org/10.11114/jets.v6i4.3022

Carson, V., Lee, E. Y., Hewitt, L., Jennings, C., Hunter, S., Kuzik, N., … Tremblay, M. S. (2017). Systematic review of the relationships between physical activity and health indicators in the early years (0–4 years). *BMC Public Health*, *17*(Suppl 5), 854. https://doi.org/10.1186/s12889-017-4860-0

Central educational data warehouse system. (2021). *Percentage of students per school-age population classified by grade level Academic year 2020*. City Data Platform. Digital Economy Promotion Agency. Retrieved from https://catalog.citydata.in.th/dataset/students-number-grading-phitsanulok-2017-2020/resource/332dc0e7-

8df9-4e44-b7b1-2e9e19c440e7

Choomai, T. (2016). Early childhood growth and development. *Hua Hin Sook Jai Klai Kangwon Journal*, *1*(2), 18–33.

Dinham, J., & Williams, P. (2019). Developing Children's Physical Literacy: How well prepared are prospective teachers? *Australian Journal of Teacher Education*, *44*(6), 53–68. https://doi.org/10.14221/ajte.2018v44n6.4

Dynia, J. M., Schachter, R. E., Piasta, S. B., Justice, L. M., O'Connell, A. A., & Yeager Pelatti, C. (2018). An empirical investigation of the dimensionality of the physical literacy environment in early childhood classrooms. *Journal of Early Childhood Literacy*, *18*(2), 239–263. https://doi.org/10.1177/1468798416652448

Early Childhood Development Policy Committee. (2021). *Early Childhood Development Plan 2021–2027*. Office of the Education Council, Bangkok: Prigwhan.

Fisher, A., Boyle, J. M. E., Paton, J. Y., Tomporowski, P., Watson, C., McColl, J. H., & Reilly, J. J. (2011). Effects of a physical education intervention on cognitive function in young children: a randomized controlled pilot study. *BMC Pediatrics*, *11*(97). Advance online publication. https://doi.org/10.1186/1471-2431-11-97

Hangchaovanich, Y. (2014). *Developing Thai children; important things that should not be overlooked*. Retrieved from https://www.thaihealth.or.th

Hernaiz-Sánchez, A., Villaverde-Caramés, E. J., González-Valeiro, M., & Fernández-Villarino, M. A. (2021). Physical Literacy and Teacher Training: Pilot Study. *Education Sciences*, *11*(2), 42. https://doi.org/10.3390/educsci11020042

Hillman, C. H., Pontifex, M. B., Castelli, D. M., Khan, N. A., Raine, L. B., Scudder, M. R., … Kamijo, K. (2014). Effects of the FITKids randomized controlled trial on executive control and brain function. *Pediatrics*, *134*(4), e1063–e1071. https://doi.org/10.1542/peds.2013-3219

Hu, R., Zheng, H., & Lu, C. (2021). The Association Between Sedentary Screen Time, Non-screen-based Sedentary Time, and Overweight in Chinese Preschool Children: A Cross-Sectional Study. *Frontiers in Pediatrics*, *9*, 767608. https://doi.org/10.3389/fped.2021.767608

Keawkungwal, S. (2010). *The Psychology of Life Development* (9th ed.). Bangkok: Thammasat University Press.

Koomkhinam, T., Daenseekaew, S., Tubtim, S., & Rattanakanokchai, S. (2016). Educational equality in Thailand: research synthesis within the research framework of equality and opportunity for fundamental education. *Graduate Studies Journal*, *13*(61), 1–9.

Koompai, S. (2020). *A comparison of educational inequality between urban high schools and rural high schools in Nakhon Si Thammarat*. King Prajadhipok's Institute.

McFarland, A. (2011). *Growing Minds: The Relationship between Parental Attitude about Nature and the Development of Fine and Gross Motor Skills in Children*. Retrieved from http://oaktrust.library.tamu.edu/handle/1969.1/ETD-TAMU-2011-05-9067?show=full

Mueanprasan, S., & Suggaravetsiri, P. (2018). Social factors associated with suspected child developmental delay at Lamplaimat district, Buriram province. *The Office of Disease Prevention and Control 7 Khon Kaen*, *25*(1), 1–11.

Office of the Basic Education Commission. (2018). *Manual for evaluating the development of students who have completed the early childhood education curriculum, 2017, academic year 2018*. Ministry of Education.

Office of the Education Council. (2018). *Guidelines for the care and development of early childhood according to competencies to increase the quality of children according to the age of 0–5 years*. Bangkok : Prigwhan.

Padan, R. (2014). Fine motor ability of early childhood enhancing patching and tearing creative art activity. *Journal of Education Research Faculty of Education* (Srinakarinwirot University), *9*(1), 101–108.

Pellis, S. M., Himmler, B. T., Himmler, S. M., & Pellis, V. C. (2018). Rough-and-tumble play and the development of the social brain: What do we know, how do we know it, and what do we need to know? In R. Gibb & B. Kolb (Eds.), *The neurobiology of brain and behavioral development* (pp. 315–337). Elsevier Academic Press. https://doi.org/10.1016/B978-0-12-804036-2.00012-1

Pharcharuen, W., Uthaphan, P., Koklang, K., & Phutchu, S. (2021). Educational disparities of Thai citizens studying age with the online learning situation in the viral age COVID-19. *PaññaPanithan Journal*, *6*(1), 1–14.

Polevoy, G. (2022). The effect of physical activity on the memory of schoolchildren. *Journal of Higher Education Theory and Practice*, *22*(16), 20–27. https://doi.org/10.33423/jhetp.v22i16.5597

Reilly, J. J., Jackson, D. M., Montgomery, C., Kelly, L. A., Slater, C., Grant, S., & Paton, J. Y. (2004). Total energy expenditure and physical activity in young Scottish children: mixed longitudinal study. *Lancet* (London, England), *363*(9404), 211–212. https://doi.org/10.1016/s0140-6736(03)15331-7

Sangmahamad, R. (2017). Disparities in Education: Social Quality in Thai's Views. *Political Science and Public Administration Journal*, *8*(1), 33–66.

Telama, R., Yang, X., Viikari, J., Välimäki, I., Wanne, O., & Raitakari, O. (2005). Physical activity from childhood to adulthood: a 21-year tracking study. *American Journal of Preventive Medicine*, *28*(3), 267–273. https://doi.org/10.1016/j.amepre.2004.12.003

Thai Health Promotion Foundation. (2019). *How the locals join hands to build up early childhood for a better future*. Retrieved from https://www.thaihealth.or.th

The Division of Public Health. (2013). *Physical Activity Environment Self-Assessment and Planning Toolkit for Childcare Settings*. NC DHHS, Raleigh, NC, and the Center for Health Promotion and Disease Prevention, NC: University of North Carolina at Chapel Hill Press.

Thongpan, S. (2022). *A research project to promote the roles of local government organizations as mechanisms in reducing inequality in education*. King Prajadhipok's Institute.

Timmons, B. W., Leblanc, A. G., Carson, V., Connor Gorber, S., Dillman, C., Janssen, I., … Tremblay, M. S. (2012). Systematic review of physical activity and health in the early years (aged 0–4 years). *Applied Physiology, Nutrition, and Metabolism*, *37*(4), 773–792. https://doi.org/10.1139/h2012-070

Tontipalacheewa, K. (2008). *Learning activities for early childhood*. Bangkok: Brain Based Book.

Tripathi, S. (2014). *Developing Thai children; important things that should not be overlooked*. Retrieved from https://www.thaihealth.or.th

Tumthong, D., Sirasoonthorn, P., Buosonte, R., & Siripornpaiboon, T. (2014). Problem of underprivileged children in education: situation of inequality in Thailand. *Journal of Humanities and Social Sciences*, *10*(1), 123–141.

Usher, W. T. (2018). Analysing an Early Child Care Physical Literacy Program: A National (Australia) Rugby League Initiative. *Journal of Research*, *9*(2), 36–45.

Yamane, T. (1967). *Elementary Sampling Theory*. USA: Prentice Hall.

#