

## The Comparison of Indoor and Outdoor Physical Activity for Locomotor Skill Programs in Preschool

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### Abstract

**Keywords:** Physical Activity; Indoor Structured Play; Outdoor Free Play; Locomotor Skill;

This study aimed to determine how far is the effect of structured movement session in natural outdoor on the gross motor skill of children, especially activities in the natural outdoor. The focus of the discussion in this study were revealed and analyzed the locomotor skills for children 5 to 6 years old of preschool, and compared of indoor structured play and natural outdoor free play on the locomotor skill of preschool children. The subjects were 2 schools with indoor structured play and another school with natural outdoor free play. Sixty children (35 boys and 25 girls) served as subjects. Data obtained through observation, documentation and then the performance a chi-square test was used to data analyze, to determine the difference in a locomotor skill between indoor structured play and natural outdoor free play of preschool children. The results of this study showed that there is no significant difference between the locomotor skills of children in indoor structured play or outdoor free play. A t-test score for independent sample was not significant ( $-2.182 < 0.05$ ) ( $t = -2.182, df = 58, p = .86$ ), its mean there was no difference in a locomotor skill between in a indoor structured play and natural outdoor free play. This allows for consideration for parents, practitioners, and academics in delivering stimulation and gross motor activities on children.

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### Abstrak

**Kata Kunci:** Aktifitas Fisik; Permainan Terstruktur Dalam Ruangan;

*Penelitian ini bertujuan untuk mengetahui bagaimana pengaruh sesi gerakan terstruktur di alam terbuka terhadap keterampilan motorik kasar anak khususnya aktivitas di alam terbuka. Fokus pembahasan dalam penelitian ini adalah mengungkap dan menganalisis keterampilan lokomotor anak usia prasekolah 5 sampai 6 tahun, serta membandingkan permainan terstruktur dalam ruangan dan*

Permainan  
Bebas Diluar  
Ruangan;  
Keterampilan  
Lokomotor;

*permainan bebas alami di luar ruangan terhadap keterampilan lokomotor anak prasekolah. Subjeknya adalah 2 sekolah dengan permainan terstruktur dalam ruangan dan satu sekolah dengan permainan bebas alam luar ruangan. Enam puluh anak (35 laki-laki dan 25 perempuan) dijadikan subjek. Data diperoleh melalui observasi, dokumentasi dan kemudian uji pefomance chi-square digunakan untuk menganalisis data, untuk mengetahui perbedaan keterampilan lokomotor antara permainan terstruktur di dalam ruangan dan permainan bebas alami di luar ruangan pada anak prasekolah. Hasil penelitian menunjukkan bahwa tidak terdapat perbedaan yang signifikan antara keterampilan lokomotor anak pada permainan terstruktur di dalam ruangan dan bermain bebas di luar ruangan. Skor uji-t untuk sampel independen tidak signifikan ( $-2.182 < 0.05$ ) ( $t = -2.182, df = 58, p = .86$ ), artinya tidak ada perbedaan keterampilan lokomotor antara permainan terstruktur di dalam ruangan dan permainan terstruktur di dalam ruangan. permainan bebas alami di luar ruangan. Hal ini memungkinkan adanya pertimbangan bagi orang tua, praktisi, dan akademisi dalam memberikan stimulasi dan aktivitas motorik kasar pada anak.*

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## 1. Introduction

Recently, many of studies have focused on the beneficial effects of physical activity on cognition, attention (Stewart, Rule, & Giordano, 2007), and academic achievement (Shoval, Sharir, Arnon, & Tenenbaum, 2017). Whereas many factors affected the children gross motor development that also needed to be studied further. It is important to be done in order to provide appropriate stimulation on children gross motor development. Gross motor skill for preschool children is believed to be important on children physical growth. Early childhood is characterized by the most dynamic phase of motor development, called the golden motor period. Considering motor fitness, a five-year-old child step in the "perfect" pre-school age or the golden age of childhood (Bogdanowicz, 1948; Przewda, 1981; Osinski, 2003). This period is fundamental motor skills indicating the importance of early childhood development.

Fundamental motor skill covers manipulative, locomotor, and stability movement skills (Aryamanesh & Sayyah, 2014), there are some skills of locomotor itself included running, sliding, galloping, jumping, hopping, and leaping (Ulrich, 2000). However, these skills do not naturally emerge during early childhood, rather they result from many factors influencing the child's motor skill development (Newel, 1986). Stimulations and explorations are needed to improve the child's motor skill especially locomotor skill. Educators have to teach skills and provide an enjoying physical activity so children become interested (Gagen &

Getchell, 2006), and motor skill development is based on the interaction between constraints from the task, the organism, and the environment (Newel, 1986). However, educators of young children often neglect gross motor skill, giving it only lip service, and instead accentuating fine motor, cognitive, and social skill in the learning process and some of them are preferred to do some activities without any energy, and tend giving some task to make children more quite, whereas physical activity allows children an opportunity to get bounded in social processes and allows them to learn (Shoval, Sharir, & Shulruf, 2014) and explore their outside world. Therefore, giving the child chance to explore their environment are the wise ways to stimulate child's locomotor skills. There are few differences in how children explore their environment, through natural outdoor or indoor.

Generally natural outdoor activities are the activities that do at outdoor environments that range from relatively natural to wild. At natural outdoor, children have big opportunities for increase their locomotor skills in natural outdoor, walking on the grass, running, jumping through the stone, and play in the playground. However, natural outdoor settings have been under-utilized in early childhood education (Miller, Tichota, & White, 2009), and teachers may not realize neither the potential opportunities for learning in the natural outdoor environment nor the alignment between early childhood pedagogy and the opportunities offered by nature experience (Ernst, 2014), hence let the children play freely without an accompaniment.

Another environment is indoor, some of the preschools did their physical activity indoor. Usually, the indoor environments were organized into learning centers and had many materials that were not available outdoor (Kroeker, 2017), have a schedule and structured play. Many preschools did not have enough area to do their physical activity outdoor, therefore they did physical activity indoor. Both environments are essential to children's skill and development, especially in locomotor skill. Therefore, this study was focused on environmental setting that may affect children's gross motor skill from all sides. It was hypothesized that there was difference in a locomotor skill between in an indoor structured play and natural outdoor free play.

Children are more active than adults, but their activity level decreases as they move toward adolescence (Centers for Disease Control and Prevention, 1997). Physical activity one of the needs of preschool children. Physical activity is the body movement produced by skeletal muscles that produce energy expenditure (CDCP). Physical activity is associated with many health benefits (Janssen, et al. 2010). Children need to release their energy into active play and this is an important period for their development, and physical activity is so critical for every children. Physical activity is any children activity appropriately described as locomotor play or active play. Active play increases from the toddler to the preschool periode and then declines during the elementary school years, with a peak at around 4 to 5 years of age (Becker, McClelland, Loprinzi, & Trost, 2014). These findings indicate that physical activity levels of children attending preschools vary greatly among school and, importantly, the characteristics of the school have a

much greater effect on a child's activity level while in the school than do the child's personal demographic characteristics (Pate, Pfeiffer, Trost, Ziegler, & Dowda, 2004).

Therefore, it is important to provide opportunities for children to carry out physical activities in unstructured play through environmental provision that stimulates physically active play and is provided by child care or school provider (Deiner & Qiu, 2007). Children who spend more time outdoors are more active than those who spend more time indoors (Hinkley, et al. 2008). However, the free play doesn't seem to warrant the significant development of more complex locomotor capabilities that seem relatively late in motor behavior of children (Derri, et al. 2001). Structured indoor activities and planned active play can facilitate movement exploration and motor skill development as well. With direction, instruction, and, guidance, Early Childhood Education majors are effective in understanding the concepts on teaching a mastery climate movement program (Robinson, Webster, Logan, Lucas, & Barber, 2012).

Further, preschool physical education is not free to play where teacher stand back, intervening only if safety is an issue; it is a time where teachers should provide cues, feedback, or help as needed related to preschoolers' performance and on their movement objectives (Murata & Maeda, 2002). It is essential to arrange environments and planned activities so that children are encouraged to be physically active and are challenged to discover moving. Preschool education, which is followed by each child, accounts for a small proportion of variance in children's physical activity, indicating that preschoolers' policies and practices have an important influence on the overall level of activity of children served by the school (Pate, et al. 2004).

Everyone will learn about basic movements. In early childhood, movements can support them interacting and adapting to others, and they are based on the performance of motor skills (i.e., fundamental motor skills such as throwing, running, catching, and jumping) (Robinson, Webster, Logan, Lucas, & Barber, 2012) and ranging from the children. All students will start learning basic movement skills in the early years and one of the movements was consist of locomotor skills. Locomotor skills are skills that involve body movement through space and compose of skills such as running, galloping, hopping, leaping, jumping and sliding (Haywood & Getchell, 2009). These skills also involves the movement of the body from one point to another. Through David's book (2015) on student involvement in sports, especially football can improve jumping, running, jumping, spinning, running fast, bouncing and sliding skills. Gross motor development in early year school students especially for locomotor skills needs to be taken seriously by teachers. This development is very important for them to perform their daily activities such as walking to school, crossing, jumping, gliding and other locomotor skills (Abdullah, Joseph, & Saleh, 2016), and playing in a natural environmant seems to have positive effects on children that the children become more creative in their play, and play activities and play forms are increasing (Fjortoft, 2001) and natural environments represent dynamic and rough playscapes that

challenge motor activity in children. This study aimed to determine how far is the effect of structured movement session in natural outdoor on the gross motor skill of children, especially activities in the natural outdoor.

## 2. Methods

This research used quantitative research and the comparison study was used to carry out a natural outdoor free play and indoor structured play, this study searched for different locomotor skill. The dependent variable of this study was the average percentage of children who have tested in locomotor skills and data was analyzed by comparative technique. In this study, the two settings of indoor and outdoor are compared to find a difference in a locomotor skill between indoor and natural outdoor. Participants included 60 children (25 girls and 35 boys) attending preschool in a kindergarten in Yogyakarta Indonesia and all of the children are in 5-6 years old. Children were sampled from two different school with different locomotor skill program. Thirty children ( $n = 30$ ) (16 girls and 14 boys) participated in the indoor structured play and thirty children ( $n = 30$ ) (9 girls and 21 boys) participated in the natural outdoor free play.

This study pefomance a chi-square test to analyze whether there was an association between the percentage of children with mastery in locomotor skill in indoor structured play or outdoor free play. This statistic provides values representing in range, with one (1) lower, two (2) middle, and three (3) higher. To investigate physical activity context influence on children proficiency the locomotor skill, this study compared average percentage of indoor structured play and outdoor free play. The data was analyzed by comparative technique at a significance level of 0.05 (Sig < 0.05). All analyses were performed using SPSS 16.0 software.

## 3. Result and Discussion

This study was examined the comparison of locomotor skill program implementation to find out how the difference of children gross motor skill through indoor or outdoor physical activity. Then, data were analyzed with the Statistical Product and Service Solutions (SPSS 16). The results of data analysis from the total subjects were 60 children, 30 children for indoor structured play and 30 children for natural outdoor free play. Variable included the score on the tests of locomotor skills. One-sample Kolmogorov-Smirnov Test with indoor structured play and natural outdoor free play as a variable showed normal distributions. And Test of Homogeneity of Variances obtained a result of the significance of 0.86 which means the data was homogeneous. The level of significance was set at 0.05.

Independent-groups t test assessed differences in locomotor skills performance raw scores between indoor structured play and natural outdoor free play. Table 1 showed that each of the aspects between children in indoor structured play and natural outdoor free play indicated significant mean differences in the leaping ( $t = -6.262$ ) and running ( $t =$

-5.037) aspects. But, t-test showed that there is no significant differences in hopping aspect.

**Table 1. Aspects of Locomotor Skills**

Locomotor Skills	Indoor (n= 30)		Outdoor (n=30)	
	Mean	SD	Mean	SD
Running	3	0	2.5	.50
Sliding	2.06	.73	2.2	.71
Galloping	2.36	.76	2.2	.77
Jumping	2.16	.64	2.43	.50
Hopping	2.33	.66	2.33	.66
Leaping	2.80	.40	1.93	.63

A t-test score for independent sample was not significant ( $-2.182 < 0.05$ ) ( $t = -2.182, df = 58, p = .86$ ), its mean there was no difference in a locomotor skill between in a indoor structured play and natural outdoor free play (see table 2). Locomotor skill of children who did physical activity in indoor structured play had a higher mean of 2.48 whereas physical activity on the natural outdoor free play has a mean 2.29 so the both of different is .19 (see table 2). In brief, children performed physical activity in outdoor free play had a smaller mean the difference was not significant to the child’s locomotor skills. Because the t value  $< t$  table (0.031619),  $H_0$  is rejected and  $H_1$  is accepted. For the variance test,  $p=0.480 > 0.05$  so  $H_0$  is accepted.

**Table 2. Locomotor Skills**

	Mean	SD
Indoor structured play	2.48	.36
Outdoor free play	2.29	.30

Physical activity is vital for a child’s development and lays the foundation for a healthy and active life (Kidsatplay, 2009), and moving is essential to the young children’s lives. Let children chance, time, and providing a good environment as the playground is the wise way to improve the gross motor especially locomotor skill. The environment around children has an important role in their development, and as a playground, the children can choose the indoor or outdoor environment.

This study investigated the comparison of natural outdoor free play and indoor structured play, and the effect on locomotor skill in preschool children. A significant difference in a locomotor skill between in an indoor structured play and the natural outdoor free play was indicated. One of the study found that a physical activity in outdoor stimulates all aspects of children’s development more readily than indoor environments (Moore & Wong, 1997). However, the findings of this study that there was no difference between the locomotor skill in an

indoor structured play and natural outdoor free play. Indoor structured play or outdoor free play give an effect to locomotor skill.

Both indoor and outdoor active play experiences are important for children to participate in structured and unstructured play, in both indoor and outdoor setting, every day (Kidsatplay, 2009). The most important is giving children chance to explore, because the children love to explore on new things that challenge their movement (Azlina & A. S, 2012), giving the time that children spend in school throughout the educational year, schoolyard and outdoor classrooms are important outdoor space for children (ACAR, 2013) making some plan for physical activity and providing accommodations such as play ground for the developmental level of all students in the indoor.

In this study the preschool children played indoor in the setting learning center. The learning setting centers included areas such as art, dramatic play, block, manipulatives, moral and religion, cooking center, and literacy center. The Children played in the scheduled center and they played at certain centers, previously the teacher has arranged and provided the equipment according to the theme and learning goals. The routine activity before the children entered to the center was performed gross motor activities as scheduled by teachers such as jumping, running, imitating animal movements, playing the balance and they did it interchangeably, and all of the activity did indoor 2,5 meters x 8 meters. While in the center, the children can manipulative, compose block, and dramatically play according to a theme, as in the theme was about occupation they can be a chef, merchant, or the other that interested. The other finding of this study, as long as the children performed activities in the arts and cultural center of the children did a lot of dance according to rhythm, played music and explored with creative materials. The children locomotor skill can develop well through music and movement. (Deli, Bakle, & Zachopoulou, 2006) found that children who participated the music and movement program have better performance than children who did not participate the movement program, more specifically they can improve the performance on galloping, leaping, horizontal jumping, and skipping. The other study found that music and movement program asserts the significance of rhythmic ability in motor skills execution (Zachopoulou, Tsapakidou, & Derri, 2004). Music and movement program is the effective ways to practice the gross motor skill especially a preschool child locomotor skill, and this activity should not do outdoor, it can be done indoor.

The outdoor environment offers unique stimulus that captures children's attention and interest (Bento, & Dias, 2017), and there was a positive impact of the natural environment on children's motor development. Natural outdoor activities are not just a time for children to expend excess energy but more than it. Another study found that the children using the forest as playscape performed better in motor skills than the children on the traditional playground (Fjørtoft, 2001). The preschool participated in the natural outdoor free play has 40 minutes to play in the schoolyard. They can run, jump, play football, and they do everything that they want in the yard. The children played outdoor at break time, moreover, the teacher let the children played freely

including the risky play. The requirements for risky play opportunities, the teachers are giving preschool children a chance to directly explore their environment (supporting free exploration of the environment), develop their motor skills (supporting gross motor skill), and improve preschool children cognitive and self-regulation skills (Laura, & Gull, 2017). While the children played, they did many locomotor activities, such as running on the sands, sliding, galloping, jumping, hopping, and leaping, moreover, they can play in the traditional playground. Many preschools facilitated the children with traditional playground with swing and slide to a more intentional outdoor learning environment with natural building materials, garden plots, logs for balancing and stacking, and a stage (Hunter, Graves, & Bodensteiner, 2017).

The differences of physical activity in this study not only did in the environment but also compared the structured and unstructured activity. In this case, the preschool children that participated outdoor did their physical activity with unstructured and free play without instruction from the teacher, while preschool children that participated with indoor structured play, the teacher planned and prepared a physical activity and every child has a chance to practice it and in the special time she or he must followed the teacher instruction. Furthermore, field notes and the results of the test indicate that the preschool that participated in this study have enough indoor/outdoor space, time, and suitable infrastructure for movement activities.

However, the record of this study in the outdoor free play, the teacher did not provide an assessment for the children's locomotor skills, that the teacher did not know the children's locomotor skill specifically. Whereas the advantages of assessment were help teacher more early to know the delays in children development, therefore teacher can adjust the appropriate activities and in accordance with the needs of children. Teachers need to offer accommodations for the developmental level of all the students and its can give preschool children learning experiences that recognize individual differences (Robinson, Webster, Logan, Lucas, & Barber, 2012). Therefore, preschool children can improve their locomotor skill effectively and the school that participated in this study was provided enough space and playful, enjoyable physical activity.

#### **4. Conclusion**

Based on the findings, this study showed that there is no significant difference between the locomotor skills of children in indoor structured play or outdoor free play and suggests that it will be better when the teacher provides a children's ability to improve locomotor skill through both indoor and outdoor. Outdoor activities not only carry out in the schoolyard, but also through field trip, or walking in the nearest garden, and these can help the children more familiar with nature and explore their environment. In addition, learning setting center can be an effective solution for schools that do not have extensive land to facilitate the locomotor skill improvement. As a note, the learning setting center must provide various materials that the children got well. For those early childhood educators, they need to recognize the importance of gross motor experience specifically locomotor skill through natural outdoor



activities or indoor structured play. Arrange the learning activities presented in ways interested children and teacher must be an active participant in physical activity to stimulate children locomotor skill.

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