EasyChair Preprint

№ 3308

Development of Gross Motor Ability in Early Childhood Through Playing Mini Outbound

Panggung Sutapa, Sakti Wibawa, Manil Kara Kauki, Kukuh Wahyudin Pratama and Aida Mustapha

April 30, 2020

DEVELOPMENT OF GROSS MOTOR ABILITY IN EARLY CHILHOOD THROUGH PLAYING MINI OUTBOUND

Panggung Sutapa[1], Sakti Wibawa[2], Manil Kara Kauki[3], Kukuh Wahyudin Pratama[3], Aida Mustapha[4]

[1]Sport Science Faculty, Yogyakarta State University, Caturtunggal, Depok, Sleman, Yogyakarta 55281, Indonesia
[2]University of Jember, Kalimantan Road No.37, Sumbersari, Jember, East Java 68121, Indonesia
[3]Centre for Sport and Exercise Sciences, University of Malaya, Universiti Road, 50603 Kuala Lumpur, Malaysia
[4]Faculty of Computer Science and Information Technology, Universiti Tun Hussein Onn Malaysia, 86400 Parit Raja, Batu Pahat, Johor, Malaysia

E-mail: panggung_s@uny.ac.id, saktiwibawa10@gmail.com, manil@siswa.um.edu.my, kukuh@siswa.um.edu.my, aidam@uthm.edu.my

ABSTRACT

The development of gross motor skills in early childhood is needed to support the development of potentials in daily life. This qualitative study was designed to determine the effect of playing outbound on gross motor skills in early childhood. The sample used in this study consists of 68 children aged between 5 to 6 years old. , amounting to 68 children. The initial tests were carried out with the five instruments, which are speed, balance, agility, arm power, and leg power. Data analysis was performed based on Z-score using ANOVA with significance level of 5%. The results showed that physical activity with mini outbound playing will be able to develop motor skills in early childhood significantly.

Keywords: Gross motor development, skills, early childhood.

1. INTRODUCTION

Children have different potential and characteristics from one another which can be developed in various ways [1]. Early childhood has a unique nature because there is a psychological and physical maturation process that will respond to the stimulation provided [2]. The development of motor skills has a fundamental role in daily life both r motor and fine motor [3]. Early childhood is the most appropriate momentum to provide physical activity because it is a golden age for optimal growth and development both social, mental, emotional and physical motor [4]. This shows that in early childhood needs to experience multilateral movement so that educators, parents provide many opportunities for children to express physical activity [5].

Symptoms that occur in the digital era at this time is with the rise of instant play that requires little physical activity, so it becomes a major factor in the decline in gross motor skills and fine motor skills in children today [6]. In addition, children are not given the opportunity by their parents to move outside the room because of injury concerns. Finally, parents allow children to play gadgets. Reduction of physical activity with the natural world also means an ecological decline and if it is left unchecked, it will not only have an impact on the child's motor development, but will also affect communication skills, tolerance, cooperation, decreased empathy for friends [7]. The situation is an example of a case that results in reduced physical activity so that the impact on gross motor development is not optimal. Physical activity in play activities can be done with a variety of ways, one of which is to play mini outbound [8].

Playing mini outdoor is playing by doing physical activities outside the room such as running, walking down a beam, throwing the ball as far as possible, moving objects from one place to another, and jumping the goal, which are all excellent options to develop physical motor skills [9]. Mini outbound playing is rarely done while it is very useful for developing logic-mathematical intelligence, practicing decision making skills, and developing kinesthetic [10]. Playing outbound mini provides a natural motion process, and when assembled in a single unit of motion it is capable of displaying the beauty of motion as well as to convey the message through the beauty of the motion [11]. The impact of these activities will naturally increase physical skill elements such as speed, balance, agility and power. An increase in the elements of physical skills is the same as an increase in the elements in the motor skills. This means if the element of skill increases, the motor ability will also increase [12].

Motion will not be separated with the science of motion, performance and body movement. Motor is divided into three parts, first is motion theory, second is motion learning, and third is motion development

[13]. The theory of motion talks about the factors of nerve function that affect human motion, learning to talk about the improvement of motion through concentration and the development of motion is a change in motion behavior that is able to reflect the interaction between the maturity of a person's organism with its environment [14]. Based on this theory, children are motivated to do something, so children can create new motor skills.

Motor can be divided into two parts, namely gross motor and fine motor, gross motor includes walking, running, jumping, throwing and pushing while fine motor covering folding scissors catch [15]. Gross motor ability is the ability to use large body muscles that are affected by the maturity of the nervous system and muscles, this activity requires a lot of energy [16]. Fine motor is the ability to use small muscles whose movements require coordination [17]. Gross motor mastery is a prerequisite for someone in mastering fine motor skills and the success of organized and unorganized movements. [18].

This scenario encourages mini outbound activities, which are also called mixed games. Mini outbound activities include activities that have the opportunity to adventure outside the room to make children move actively such as to run fast, to walk on a beam, to move a colored stick, to throw a ball or to jump over the goal [19]. Outbound playing is carried out sequentially, which is divided into several posts that are played continuously such as starting from the first post to the fourth post, children must complete the activities at the first post in order to continue on the second post and so on [20].

This paper is set to explore the effect of playing outbound on gross motor skills in early childhood. The remaining of this paper proceeds as follows. Section 2 presents the materials and methods, Section 3 present the results and discussion, and finally Section 4 concludes the paper.

2. MATERIALS AND METHODS

This study was carried out using one-group research design where the group was given the treatment of playing mini outbound with a frequency of three times per week for a duration of two months. The number of samples used was 68 children aged between 5 to 6 years consisting of 34 boys and 34 girls. The initial tests included 1) sprinting in 20 meters to assess the children' speed, 2) walking down a 4-meter long beams to assess their balance, 3) throwing the tennis ball as far as possible to assess the power of the arm, 4) running back and forth along 4 meters to find out agility, and 5) long jumping without the start to assess the leg power. After the data is obtained, this study calculated the Z-score, so it can be added to one value.

After the initial test, the group was given treatment by playing mini outbound that consists running from Post 1 to walking down the 4-meter long beams, running to Post 2 to move 4 colored sticks from one place to another with a distance of 2 meters, continued to running to Post 3 to throw the ball as far as 10 pieces, and finally the last run to go to Post 4 for jumping over 5 small goal posts. The data collected were analyzed using ANOVA at significance level of 5%.

3. RESULTS AND DISCUSSION

The results from the statistical tests showed that playing mini outbound motor skills significantly increased the gross motor abilities among the children with a significance value of $p < 0.05$. This showed that the activeness of the body in doing outdoor activity is very helpful in developing gross motor skills during early childhood. Table 1 shows the test results before and after the treatment, where F is the test statistic of Levene's test, Sig. is the p-value corresponding to this test statistic, t is the computed test statistic, df is the degrees of freedom, and Sig. (2-tailed) is the p-value corresponding to the given test statistic and degrees of freedom.

Table 1: Test results before and after treatment

No.		Assumption	F	Sig	t	df	Sig (2-tailed)
1	Run	Equal variances assumed	0.130	0.910	3.748	66.000	000
		Equal variances not assumed			3.748	65.961	000
2	Balance	Equal variances assumed	0.140	0.906	8.535	66.000	000
		Equal variances not assumed			8.535	65.985	000
3	Agility	Equal variances assumed	0.750	0.785	8.634	66.000	000
		Equal variances not assumed			8.634	65.976	000
4	Arm Power	Equal variances assumed	3.556	0.064	-7.638	66.000	000
		Equal variances not assumed			-7.638	57.413	000
5	Leg Power	Equal variances assumed	2.295	0.135	-11.875	66.000	000
		Equal variances not assumed			-11.875	64.803	000

From Table 1, it can be seen that the mini outbound treatment is very influential on speed, balance, agility, arm power and leg power all of which show significant differences $p < 0.05$.

Next, Table 2 shows the a decrease in running time which means an increase in speed, a decrease in time to walk the beams means an increase in balance and a decrease in running time back and forth means an increase in agility. These improvements were statistically significant at $p < 0.05$.

Table 2: Decreased time before and after treatment

No	Agility	Time Before Treatment	Time after Treatment	Difference
1	Speed	4.3391	3.3391	1.0000
2	Balance	6.9574	6.0403	0.9171
3	Agility	3.9291	3.3506	0.5785

Finally, Table 3 shows that there has been a significant increase in arm power and leg power $p < 0.05$. This shows that through playing outbound mini can help develop elements of gross motor skills such as arm power and leg power.

Table 3: Addition of arm and leg power

No	Power	Time Before Treatment	Time after Treatment	Difference
1	Arm Power	4.1909	4.9135	0.7226
2	Leg Power	1.0941	1.1571	0.6300

From overall observation and the data collected, playing is not only a fun activity for children but it also help to improve fitness and health. An increase in fitness by itself will increase the child's motor skills. Increased motor ability also means an increase in the ability to function the muscles of the body including strength, endurance, speed and agility, balance and body regulation [9]. Playing with physical activity in early childhood means providing intervention, early stimulation besides beneficial to maintain health and improve fitness [21]. Playing with outbound means using physical activity, as children must move the muscles of their body to contract, which in turn help improve the body's abilities including motor skills.

Playing outbound by running can be used to develop speed, walk down the beam to stimulate balance, move objects from one place to another to stimulate agility, throw the ball to stimulate strength and jump over the goal to stimulate explosive power. These elements of motion are the basic elements of motion that exist in motor skills, thus playing outbound can make the body actively move which will develop the motor. Outbound playing aside from being an activity to develop children's motor skills, playing outbound also influences their emotional and intellectual development. Through doing directly while playing becomes a new experience to develop knowledge and develop children's creativity [20].

Early children who are active in physical activity will have a better quality of life than children who are not active, because their fitness will increase and improve the quality of organs including: cardiovascular, cardiorespiratory, blood vessels, energy metabolism, and immunity [22]. Active play has a paradoxical impact, increasing the attention span and increasing the efficiency of thought and creativity to solve problems. The same thing agrees with [17] that the motor game is a positive practice which improves the acquisition of emotional skills and the development of social relationships, as well as the promotion of emotional skills, and imagination, enhancing children's self-esteem.

5. CONCLUSIONS

Childhood is a period of play because it is entering its world, by actively engaging in a lot of things that are gained not only physically beneficial but also beneficial to cognitive and affective. Playing outbound, children become happy, do not feel heavy and boring to repeat the movement so that the muscles of the body will be active for activities. Outbound activities include running, walking down blocks, moving colored sticks, throwing balls and jumping around so speed, balance, strength and agility will increase. With the increase in physical elements, especially large muscles, it also means an increase in the gross motor skills of children needed to carry out daily activities.

ACKNOWLEDGEMENT

This research is supported by Yogyakarta State University

REFERENCES

1. A. Han, A. Fu, S. Cobley, and R. H. Saunders. **Effectiveness of exercise intervention on improving fundamental movement skills and motor coordination in overweight/obese children and adolecents: A systematic review**. *Journal Sci. Med. Sport*, Vol. 21, No. 1, pp. 89-102, 2017.
2. J. Allwood. **Governing early childhood education through play.** *Contemporary Issues in*

Early Childhood", Charles Stuart University, Australia, 2013.

3. C. Bjartveit and L. Panayotidis. **Transforming early childhood educators' conceptions of "dark play" and popular culture.** *Contemporary Issues in Early Childhood*, Vol. 18, No. 2, pp. 114-126, 2017.
4. J. A. Connelly, M. Champagne, M., and S. Manningham. **Early Childhood Educators' Perception of Their Role in Children's Physical Activity: Do We Need to Clarify Expectations?**, *Journal of Research in Childhood Education*, Vol. 32, No. 3, pp. 283-294, 2018.
5. A. Cristia and A. Seidl. **Parental reports on touch screen use in early childhood**. *PloS ONE*, 2015.
6. E. L. Essa. **Instruction to early childhood education.** USA. Cengange Learning, 2014.
7. A. D. Faigenbaum, J. A. Bush, R. P. McLoone, M. C. Kreckel, A. Farrell, N. A. Ratamess, and J. Kang. **Benefits of strength and skill-based traing during primary school physical education.** *Journal of Strength and Conditioning Research.* Vol. 29, No. 5, 2015.
8. G. S. Goldfield, A. Harvey, K. Grattan, and K. B. Adamo. **Physical activity promotion in the preschool year: A crucial period to intervene.** *International Journals of Environmental Reseach and Public Health.* Vol. 9, pp. 1326-1342, 2012.
9. J. Jelsma, M. Pronk, G. D. Ferguson, and L. D. Jelsma. **The effect of the nintendo wii fit on balance control and gross motor function of children with spastic hemiplegic cerebral palsy.** *Developmental Neurorehabilitation*, Vol. 16, No. 1, pp. 27-37, 2012.
10. I. Jenssen and A. LeBlanc. **Sytematic review of the health benefits of physical activity and fitness in school-aged children and youth.** *International Journal of Behavioral Nutrition and Physical Activity*, Vol. 7, No. 1, pp. 40, 2010.
11. A. Jill and J. M. Ramon, J. M. **Perceptual-motor activity for children an evidence-based guide to building physical and cognitive skills.** *Human Kinetic*, 2011.
12. O. Kavramina and G. Metaforlari. **Early Childhood Education Teachers' Metaphors about Play Concept for Preschoolers.** Eğitimde Kuram ve Uygulama, Vol. 12, No. 1, pp. 372-388, 2016.
13. N. Khalaj and S. Amri. **Mastery of gross motor skill interventions among Turkish preshoolers: a review of the Turkish literature and recomendations.** *Middle-East Journal of Scientific Research*, 2013.
14. J. Kokstjen, M. Musalek, P. Stastny, and A. Golas. **Fundamental motor skills of Czech children at the end of the preschool period.** *Acta Gymnica*, Vol. 7, No. 4, pp. 193-200, 2017.
15. A. G. Lemos, E. L. Avigo, and J. A. Barela. **Physical education in kindergarten promote fundamental motor skill development.** *Physical Education*, Vol. 2, No. 1, pp. 17-21, 2012.
16. M. Lynch. **More play, please. The perspective of kindergarten teachers on play in the classroom.** *American Journal of Play*, Vol. 7, No. 3, pp. 347 -370, 2015.
17. P. G. Madrona. **Site development and teaching of motor skills in early childhood education.** *Journal of Arts & Humanities*, Vol. 3. No. 11, pp. 09-20, 2014.
18. M. W. Y. Eng. **Motor skills development.** Singapore: Ministry of Education, 2013.
19. M. H. Park, C. Falconer, R. M. Viner, and S. Kinra. **The impact childhood obesity on morbidity and mortality in adulthood: A systematic review.** *Obesity Review*, Vol. 13, No. 11, pp. 985-1000, 2012.
20. A. L. Parson. **Early childhood educators' contruction of play belief and practice.** *Political Science*, 2013.
21. Tandon, P. S., Saelens, B. E., Zhou, C., & Christakis, D. A. (2018). **A comparison of preschoolers' physical activity indoors versus outdoors at child care**. *International journal of environmental research and public health*, 15(11), 2463.
22. Faigenbaum, A. D., Bush, J. A., McLoone, R. P., Kreckel, M. C., Farrell, A., Ratamess, N. A., & Kang, J. (2015). **Benefits of strength and skill-based training during primary school physical education**. *The Journal of Strength & Conditioning Research*, 29(5), 1255-1262.