

**The Development Pattern of Early Age Children's Motor Skills****Hari Amirullah Rachman<sup>1✉</sup>, Gustiana Mega Anggita<sup>2</sup>**Faculty of Sport Science, Yogyakarta State University, Indonesia<sup>1</sup>Department of Sport Science, Faculty of Sport Science and Health, Universitas Negeri Semarang,  
Indonesia<sup>2</sup>**Article History**Received 26 June 2018  
Accepted 28 June 2018  
Published June 2018**Keywords:**Early Age Children;  
Development; Motor  
Skills; Pattern; Movement.**Abstract**

This study was aimed at identifying the pattern of early age children's motor skills development. By acknowledging the pattern, a program was expected to be developed to improve the early age children's motor skills. Motor skills are not only closely related to children's physical abilities and intelligence but they are also associated with children's psychological aspect. Denver Development Screening Test (DDST) was used as the research instrument. Then, the obtained data were analyzed by using descriptive statistic. The data and information were collected from respondents using observation sheets. After collected, the data were explained descriptively. The population of this study involved the early age children in the kindergartens. Moreover, in order to prevent distortion of data, the data collection employed Stratified Random Sampling technique in which population is grouped into five based on regencies and sub-grouped based on districts, so the groups of population were homogenous. The research findings present the early age children's motor skills development pattern. In general, the results are: social behavior aspect is categorized as very good, and its percentage point is 57.14%; language aspect is categorized as very good, and its percentage point is 61.91%; gross motor skill aspect is categorized as very good, and its percentage point is 71.44 %; and the fine motor skill aspect is categorized as very good, and its percentage point is 57.14%. Based on the findings, it can be inferred that children's motor skills development is an important part in the human life span. On the other hand the more important thing is how children innate motor skills can be optimized in a program suitable with children needs, so they can benefit from doing appropriate physical activities.

**How to Cite**

Rachman, H. A., Anggita, G. M., (2018). The Development Pattern of Early Age Children's Motor Skills. *Journal of Physical Education, Sport, Health and Recreation*, 7(2), 104-112.

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## INTRODUCTION

Movements are one of the characteristics of human as a living being. By doing movements, humans sustain their existence as one of the living beings who can explore their environment endlessly. Moreover, humans make use of movements as the media to prevent problems they deal with in their lives. Therefore, it can be stated that humans are alive because they move.

Body movements has existed since the ovulation process when a sperm cell fertilizes an egg and then a fetus is formed in a mother's uterus. The fetus starts to move, continues to move until it is born as an infant and keeps on moving and leads the generation until the end of life. In a human life span, movements are the only thing developing as humans grow since the prenatal ovulation process until the end of their life.

Movements are one of the essential things for human beings. Its importance is represented through the pattern which goes along the movement of growth and development. The growth and development of movements include the process of providing chances on some function improvements, namely: (a) sensomotoric perceptual functions, (b) intellectual functions, (c) emotional psychological functions, and (d) social functions (O'Regan, et al., 2000).

Therefore, growth and development are inseparable processes which depend on each other. It means that growth goes along with development. In this aspect, growth is defined as the increase of cells and intercellular tissue in number and size. It represents the development of body proportion and structure in some parts and a whole, so they can be measured with length and weight units. On the other hand, development is the growth of physical structure and functions into the more complex forms including the areas of gross and fine motor skills, speaking and language skills, social behavior, and independence. Growth occurs simulatniously with development.

Motor skills development is changes in behavior which occurs in the life cycle of human which continuously influenced by the demands of individual biologic and environmental tasks. Bassicaly, the growth goes along with children nerves and muscles maturity. Thus, every movement, including the simplest ones, are a set of result of a complex interaction pattern coming from various parts and systems which are controlled by the brains. Motor skills development refers to children's bone and muscle growth as well as other abilities in moving and manipulating the environment. Motor skills development is catego-

rized into two: gross and fine motor skills development. (Allen et al., 2010: 1). It is stated that children's gross motor skill development involves the growth of their large muscles. This muscle group enables us to get involve in some activities, such as sitting down, standing up, walking, running, and etc. Meanwhile, fine motor skill development involves the group of small muscle in the body, especially the ones located in hands.

According to Bowlby, et all., 2009 ; Bremner, 2017, motor skills development includes the process of how children's muscle work well. It refers to muscle stability. Children need a muscle stability to develop their muscle groups and make use of them to stand up, sit down, walk, run, swim, and perform some position and activities.

Motor skills development also includes children vestibular and proprioceptive systems. Those are parts of children's sensory systems. Vestibular system is located in the inner part of ears. It enables us to control the body balance. Proprioceptive system includes the inner part of ear, muscles, joints, and tendons. This system makes the body aware of its condition, control body balance and postures, and gain well-coordinated movements which can only be maintained by a well-functioned proprioceptive system (Berg, 2002: 14).

The characteristics of the children motor skills development is commonly based on the stages which can be predicted by two moments. They are the inner to outer body parts and from upper to lower body parts movemement development. The inner to outer development refers to the condition where children are able to develop and control their upper arms before being able to develop and control their finger movements. Meanwhile, upper to lower body development is shown from head control and them followed by limbs and toes controls.

Gordon and Browne (2008: 112) state that the quality of motor skills development will influence how well children grow in other areas, for example, motor skills influence cognitive skill development, independency skill, as well as communication skill. The development affects social and emotional development.

Children of early age have particular physical, social, and moral characteristics, Tientje et al., (2004,1.4-1.9) elaborates the characteristics of children of early age, they are : a) possessing high level of curiosity, b) having unique personalities, c) fantasizing and imagining frequently, d) having valuable period to become potential learners, e) showing egocentric personality, f) having short attention span. Early childhood is a golden period

for children, because it is the period when they have rapid growth and development. Children are mostly sensitive and potential about learning something, and they possess very high level of curiosity. It is shown at how children keep on asking questions about things they see unless the questions are answered. Teachers need to apprehend children's characteristics to optimize the teaching learning process. They can deliver teaching material which is suitable for children development. Another view related to children characteristics is stated by Indrawati et al.,(2006: 43-44). It is presented as follows.

Most of kindergarten children possess some specific characteristics, i.e. 1) physical development aspect: children are physically very active in various activities which can develop their muscles, 2) language acquisition aspect: language skill is getting better, so children are able to understand other speakers' utterances and express their thought, 3) cognitive development aspect: children's cognitive skill is rapidly developed, it is shown from their high level of curiosity related to their environment. They ask questions about what they see frequently, 4) game aspect: they play individual games although played with others.

The first five years of children's life is a great period for learning and development. Knowledge on the children's rapid development help parents and caregivers to prepare to give active and guided attention at children early childhood in order to guide and promote early learning which serves as the support for the next stages of learning in the future. Acknowledging children development is an important point in teaching children.

Bergen (2008: 24) reveals that developmental changes is the basis of human existence, and every person has unique developmental changes. Although there is an accepted universal assumption about the similarities of human's development principles, there is no children with exact development. Children's development patterns are different from each other in physical, cognitive, social, and emotional aspects. In addition, they interact and respond to their environment differently, and they are different in some other factors. Some children may always look happy and energetic, but some do not have cheerful personality. Some are active, but the others are calm. It is even possible to find children with better management ability than others. Having the knowledge of children's development pattern enables us to help and give attention to children.

Children's development refers to changes

or growth which occur all along the life, from birth to adolescence. The changes occur in a regular stages involving physical, cognitive, and emotional development. The three main areas of children's development are the ones which occur in a predictable pattern and orderly yet they occur in different rate and time from one person to others (Bowlby, 2009: 12).

Children's motor skills development is represented from their mastered motor skills. The motor skills are divided into two i.e. gross and fine motor skills. According to Kurtz (2007: 58), in general gross motor skill refers to movements which involve large muscles, such as arms, legs, feet, and the whole body (used in walking, jumping, etc.). Meanwhile, fine motor skill refers to movements which include the small muscle group, such as the one in hands, wrists, and fingers (in order to hold pencils and toys). However, as the focus of both skill groups, it can be seen that those skills are overlapping. For example, an infant's hand can perform the activity of taking toys off the floor (fine motor skill). It is easier for him/her to do the activity when he/she has learnt how to sit (gross motor skill). Another example is when children get something from a shelf, they use both large muscle group (walking to the shelf and then grabbing for the thing) and small muscle group (grasping the toys using their fingers). Those activities demands much complicated coordination which is required to complete "a simple task".

Jürimäe, et.al., (2000: 77-112) states that individuals' physical development includes four aspect, namely (1) the nervous system which affects greatly on intelligence and emotional development; (2) muscles which affect the motor strength and skills development, (3) the endocrine gland which triggers new behavior patterns, for example in a case of adolescence who gets excited to actively joining an activity where the members are the opposite sex, (4) physical/body structure which includes height, weight, and body proportion.

Physical development is closely related to children's motor skills development. Motor skills is a body movement control which is developed through coordinated activities consisting of nerves system, muscles, brain, and spinal cord. Motor skills development includes gross and fine motor skills. Gross motor skill refers to body movements which employ large muscles or the most or all of body parts influenced by children maturity. For example, the abilities to sit, kick, run, and go up and down of stairs. Meanwhile, fine motor skill refers to body movements which involve small muscles or some body parts. The movements are

influenced by chances to learn and practice. For example, the abilities in moving objects from both hands, doodling, arranging blocks, cutting, writing, etc. Those abilities are very essential for an optimum children's development.

Every individual has different motor skills development. There are people with very good motor skills development, such as an athlete, but others have physical disabilities. Gender differences influence these aspects, according to Marta et al., (2012), girls in middle childhood possess 5%-10% higher physical flexibility than boys of the same age although the boys have better athleticism than the girls, such as in running, jumping, and throwing.

Motor skills represent children's desires. When a child sees a variety of toys, his/her perception of playing with the toys is processed in their brain. It motivates him/her to do something and act it out by moving and taking the toys. As a result, he/she is successful in getting what they aimed; it is taking the toys they interested in.

".....to develop motor skills, infants must perceive something in the environment that motivates them to act and use their perceptions to fine-tune their movement. Motor skills represent solutions to the infant's goal."

Moreover, the theory explains that the moment when infants are motivated to do something, they can create a new motor skill. The skill is a result of many factors namely: nervous system development, physical abilities enabling the infants to move, desire motivating them to move, and an environment supporting motor skills acquisition. For example, children will start walking if their nervous system is mature, leg proportion is strong enough to support their bodies, and if they have desire to take their own toys.

Motor skills are not only closely related to children's physical abilities and intelligence but they are also associated with children's psychological aspect. Su et al., (2016: 160) states that children physical abilities are closely related to children's self-image. Children who have better physical abilities in sport are respected by others. It is in line with the research done by Lowery (2005) which reveals that motor skills are closely related to self-esteem. Logan et al., (2017) mention that "Golden Years of Motor Development" is between the period of 2-6 years. It shows that motor skills can be developed best when children are at the age of 3 to 6. Some experts refers to the period as "early childhood".

According to Supartini (2004), children of early age refer to 3-6 year old children. They show progressive motor, verbal, and social skills

development. At the period, children show an improving enthusiasm and energies to learn and explore. Pre-school children have knowledge and experience acquired from families, schools, and social environments (society). Children environments have an important role in learning. The environments basically have significant role in building children's good personalities which impacts on their growth and development. The environments must provide positive responses to children, so they can build good personalities who are faithful and pious in God.

In pedagogical view, children age period is divided into two, i.e. preschool (3-6 years) and primary (7-12 years) (Biechler et al., 2003: 8). Preschool children commonly attend day care program at the age of 3-5 years old, play group at the age of 3-4 years old, and kindergarten program.

There are 3 development stages in children motor skills, they are: (1) head-to-toe development, (2) unintended into intended movements, (3) random into organized movements.

Dynamic System Theory developed by Thelen et al., (2003) is the theory which explains children's motor skills system in details, It reveals that in developing motor skills, children need to perceive something that exists in their environment. It motivates them to make an effort and make use of the perception to move. . Spencer (2011) ; Phillips(2010). Motor skills represent children's desire. The Dynamic System Theory reveals that when infants are motivate to do something, they develop a new motor skill. The skill is the result of many factors, namely: nervous system development, physical abilities enabling babies to move, desire motivating babies to move, and an environment supporting motor skill acquisition (Payne et al., 2017).

Early age children's performance and gesture are easily differentiated from those at the previous age period because of some reasons. They are presented as follows: (1) Children of early are generally active; they can control their body and like to do individual activities. (2) After doing some activities, children need to get enough rest. Most of the time they do not know that they need to get enough rest, so calming activities needs to be scheduled. (3) Children's large muscles have grown, and they can control their fingers and hands. Therefore, unskilled children cannot perform complicated activities, such as tying shoelaces. (4) Children find difficulties in focusing on small objects, so they have lack of hand coordination. (5) Although children's bodies are flexible their skull is soft to protect their brain.

At the early age, children's hand stroke is at the "pattern making" stage. It is the most difficult stage because the children have to create shapes, so they are really demanded to make use of their imagination. In the aspect of gross motor skill, children of early age have been able to move all parts of their bodies i.e. running, walking up and down the stairs, throwing balls, and doing more than one movements at once (jumping while throwing a ball). Based the discussion, the objective of this study is identifying the pattern children's motor skill development in Yogyakarta special regency. By acknowledging the children's motor skills development pattern, a program focusing on early age children's motor skills is expected to be developed.

## METHODS

It was a descriptive study done by conducting survey. Kerlinger states that research survey is conducted in large and small groups of population, and the analyzed data from samples are taken from those groups of population (Riduwan, 2012: 49).

Survey is a research methodology done by taking samples from a population and then using instruments to collect data. In this study, the data and information were collected from respondents using observation sheets. After collected, the data were explained descriptively. At the end of the study, some evidences, characters, and correlations between the tendencies found in the study were analyzed using explanatory research design.

The survey was done by doing observations in order to collect the data on children's gross and fine motor skills activities done at schools. This study was done widely in effort to acquire findings which can be used immediately to give a descriptive treatment which functions as formulation and description of the evidences. This study went through some stages, i.e. an introductory study, observation, and data analysis. It was conducted in kindergartens located in Yogyakarta in May-October 2015. The population of this study involved the early age children in the kindergartens. Moreover, in order to prevent distortion of data, the data collection employed Stratified Random Sampling technique in which population is grouped into five based on regencies and sub-grouped based on districts, so the groups of population were homogenous.

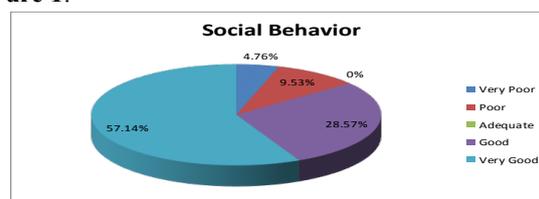
The samples of this study were analysed using Slovin formula (1960) as cited in Sudjana (2003: 56). Based on the analysis, 106 samples were obtained. They were: (1) 26 respondents

coming from Yogyakarta City, (2) 20 respondents coming from Sleman regency, (3) 20 respondents coming from Bantul Regency, (4) 20 respondents coming from Gunungkidul Regency, and (5) 20 respondents coming from Kulonprogo Regency. The data were collected using children's motor skills development observation instrument called DDST (Denver Development Screening Test). DDST is one of the screening methods on children's developmental problems. The test does not belong to either diagnostic test or IQ test. DDST is used to estimate social contact, fine motor skill, and gross motor skill of 2 months to 6 years old children. There were 125 tasks constructed based on developmental stages and categorized into 4 big groups called developmental sector.

The collected data were analyzed using Descriptive Statistic by meeting all the analysis requirements. Descriptive Statistic was used to analyze and describe the obtained data as they were without concluding or generalizing. The analysis was done by collecting the basic data in the form of description without explaining the correlations, testing the hypothesis, predicting, or concluding.

## RESULTS AND DISCUSSION

Based on the collected and analyzed data, children's social behavior is presented below in **figure 1**:



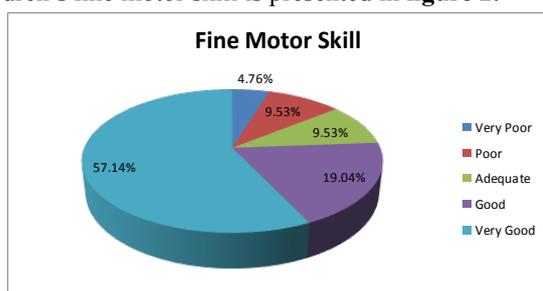
**Figure 1.** The Chart of Children's Social Behavior

The chart shows that children social behavior categorized as Very Good is in the percentage of 57.14% or consisting of 61 children; Good is in the percentage of 28.57% or consisting of 22 children; Adequate is in the percentage of 0%; poor is in the percentage of 9.53% or consisting of 10 children; and Very Poor is in the percentage 4.76% or consisting 5 children. Based on the analysis, it can be inferred that the children's social behavior is categorized as good.

In the aspect of fine motor skill, the data can be elaborated as follows: the total scores is 1769, the mean score is 84.23, mode is 100, Standard Deviation is 18.56, the lowest score is 40, and the highest score is 100.

Based on the frequency distribution, the chil-

dren’s fine motor skill is presented in **figure 2**.

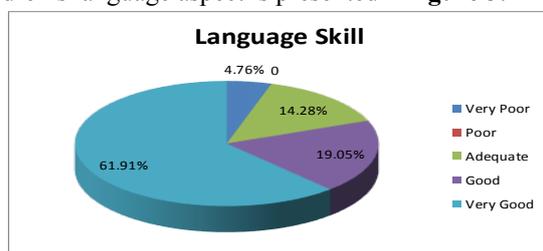


**Figure 2.** The Chart of Children’s Fine Motor Skill

The chart shows that the children fine motor skill categorized as Very Good is in the percentage of 57.14% or consisting of 70 children; Good is in the percentage of 19.04% or consisting of 20 children; Adequate is in the percentage of 9.53% or consisting of 10 children; poor is in the percentage of 9.53% or consisting of 10 children; and Very Poor is in the percentage 4.76% or consisting 5 children. Based on the data analysis, it can be inferred that the children’s fine motor skill is categorized as good.

In the aspect of language, the statistic analysis is elaborated as follows: total score is 1833, the mean score is 87.29, mode is 100, Standard Deviation is 14.92, the lowest score is 62, and the highest score is 108.

Based on the frequency distribution, children’s language aspect is presented in **figure 3**:

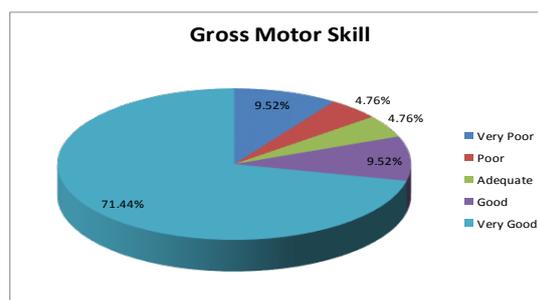


**Figure 3.** The Chart of Children’s Language Skill

The chart shows that language skill categorized as Very Good is in the percentage of 61.91% or consisting of 65 children; Good is in the percentage of 19.05% or consisting of 20 children; Adequate is in the percentage of 14.28% or consisting of 15 children; Poor is in the percentage of 0%; and Very Poor is in the percentage of 4.76% or consisting of 5 children. Based on the data analysis, it can be inferred that children’s language development is categorized as very good.

In the aspect of gross motor skill, the statistic analysis is elaborated as follows: the total score is 1830, the mean score is 87.14; mode is 100, Standard Deviation is 16.49, the lowest score is 63, and the highest score is 116.

Based on the frequency distribution, the data on children’s motor skill development are presented in **figure 4**:



**Figure 4.** The Chart of the Children’s Gross Motor Skill

The chart shows that the children’s gross motor skill is categorized as Very Good is in the percentage of 71.44% or consisting of 75 children; Good is in the percentage of 9.52% or consisting of 10 children; Adequate is in the percentage of 4.76% or consisting of 5 children; Poor is in the percentage of 4.76% or consisting of 5 children; and Very Poor is in the percentage of 9.52% or consisting of 10 children. Based on the data analysis, it can be inferred that children’s gross motor skill development is categorized as very good.

## DISCUSSION

In accordance with the result findings elaborated in the previous part, some aspects related to this research implementation are presented as follows.

First, the aspect of social behavior is categorized as good. Human is a growing being that always thrive on living. Children’s growth and development are rapid and fundamental in their early age. The children’s development depends greatly on the stimulation given in the early age. It is in line with Singh (2016: 282) opinion stating that

“... the important part of social development is on how children interact in their environment to serve the children’s need on developing their social skill and mental.”

This opinion supports the research findings in which respondents learn to provide curriculum which enables children to learn to interact and exercise and then develop their emotional and social skills. The environment this study took place enables children to interact with each other, so it can develop good social and emotional skills. On the contrary, Su et al. (2016: 159-160) argues that the inability to interact in physical activities through sports causes inadequacy of social behavior including the lack of self-conception. The argument concludes that the high level of self-conception will improve children motivation to be actively participate in physical activities and exercise.

The development of human resources who are physically, psychologically, mentally, and emotionally healthy depends on the growth and development processes. The development involves physical, cognitive, emotional, and psychological growth of children at the age of infancy and toddlerhood (0-3 years old), early childhood (3-6 years old), and middle childhood (6-11 years old). A study done by Güçlü (2016: 2) proves that the social skill level and the personality of an athlete enhance as his/her physical and sport abilities are improving. It proves that movement development is closely related to children's social and character development. Moreover, it is supported by a research finding revealed by Vlahov (2014: 289) that early age children's movement development can predict their physical fitness and health when they are in senior high school.

Second, regarding the aspect of fine motor skill, it can be concluded based on the obtained mean score that the children's motor skills are categorized as good. It indicates that children of early age get opportunities to develop fine motor skill in a good education. Early childhood is the golden age of individual development span. At this period, children have the greatest motor skills, emotional, cognitive, and psychological growth. Children's development is a holistic process. Thus, stimulation should be provided in holistic activities. Perceptual motor skill can be used to develop fine motor skill as Hong (2010: 77) says that activities, such as arranging blocks, building Legos, drawing, or playing games requiring fingers usage are essential in improving children's fine motor skill.

Third, based on the research findings, it is concluded that the children's language skill aspect is categorized as good. 61.91 % of the children have good vocabulary mastery. Besides, in relation with children's cognitive and language skills, Santrock(2017) said its (50) states that language skill is influenced by other developmental aspects especially physical and intelligence aspects. Children who interact using different languages show significant language skill development. As it is shown from the research findings, each child's development has different physical development as in language skill development. There are children who grow rapidly or slowly. Fourth, in accordance with the children's gross motor skill, the respondents of the study (4-6 years old) have well-coordinated gross motor skill. Their movements are in accordance with their need and desire. This period is shown with hyperactive and movements. The children tend to perform plenty agile and energetic gross motor skill movements. Hence, the age range (4-6 year old) is the ideal period to learn motor skills in some activities such

as: writing, drawing, painting, swimming, playing football, and doing athletics activities. Kelly (2010: 20) states that in that period children have mastered locomotors skills in order to participate in various games, sport, and physical fitness activities.

The understanding of children growth and development pattern is really needed by parents and teachers in order to take care of the environments where children are stimulated to learn. Children's growth and development are rapid processes. Every process leads to the skills. However, there is no sufficient evidence in relation to benefits of children's physical activities and sports. Vella (2014; 6) states maintaining information on children's development on report cards can help parents and teachers in optimizing children's movement development.

Children's motor skills development, social and emotional development, and abilities to acquire and use language are very essential in developing new skills needed for their growth in every stage of development to become the pinnacle of future generation. Parents and teachers can enhance children's exploration and curiosity by improving their growth and development holistically. Jarani (2015: 11) states that there needs to be an intervention on physical education program and curriculum to improve children's physical abilities. It is in line with the research done with children in Albania. Based on the explanation, children's motor skills development will become a good potential when supported with sufficient preparation on a good physical education program and a curriculum that is developed based on children's movement development.

Based on the previous discussion, it can be inferred that children's motor skills development is an important part in the human life span. On the other hand the more important thing is how children innate motor skills can be optimized in a program suitable with children needs, so they can benefit from doing appropriate physical activities. Veldman et al. (2017:53) states that children's physical and sports inactivities should be noticed; especially when they are incapable in most everyday life skills. This indicates that motor skills development is an aspect people should focus on in order to make sure that children will grow as qualified and competitive human resources.

## CONCLUSION

Based on the research findings and discussion, it can be concluded that:

In the aspect of social behavior, the percentage of very good category is 57.14% or consisting of 61 children. The percentage of good category is 28.57% or consisting of 22 children.

The percentage of adequate category is 0%. The percentage of poor category is 9.53% or consisting of 10 children. The percentage of very poor category is 4.76% or consisting of 5 children. According to the data analysis, it can be concluded that the aspect of children's social behavior is categorized as good.

In the aspect of fine motor skill, the percentage of very good category is 57.14% or consisting of 70 children. The percentage of good category is 19.04% or consisting of 20 children. The percentage of adequate category is 9.53% or consisting of 10 children. The percentage of poor category is 9.53% or consisting of 10 children. The percentage of very poor category is 4.76% or consisting of 5 children. According to the data analysis, it can be concluded that the aspect of children's fine motor skill is categorized as good.

In the aspect of language skill, the percentage of very good category is 61.91% or consisting of 65 children. The percentage of good category is 19.05% or consisting of 20 children. The percentage of adequate category is 14.28% or consisting of 15 children. The percentage of poor category is 0%. The percentage of very poor category is 4.76% or consisting of 5 children. According to the data analysis, it can be concluded that the aspect of language skills is categorized as very good.

In the aspect of gross motor skill, the percentage of very good category is 71.44% or consisting of 75 children. The percentage of good category is 9.52% or consisting of 10 children. The percentage of adequate category is 4.76% or consisting of 5 children. The percentage of poor category is 4.76% or consisting of 5 children. The percentage of very poor category is 9.52% or consisting of 10 children. According to the data analysis, it can be concluded that the aspect of children's gross motor skill is categorized as very good.

## REFERENCES

- Allen, K.E. & Marotz, L. R. (2010). *Developmental profiles: pre-birth through twelve*, 6th edition. Belmont, CA: Wadsworth, Cengage Learning.
- Berg, L. E. (2002). *Infants, children and adolescents*, 4th edition. Boston, MA: Allyn and Bacon.
- Bergen, Doris. 2008. "Stages of Play Development," *Play as a Medium for Learning and Development*. Doris Bergen, ed., Portsmouth, NH: Heinemann.
- Biechler, RF & Snowman, J. (2003) *Psychology Applied Teaching*. Toronto: Houghton Mifflin Company.
- Bowlby, J and Ainsworth, M. 1992. *The Origins Of Attachment Theory*. *Developmental Psychology*, 28, 759-775; available at: [http://www.psychology.sunysb.edu/attachment/online/inge\\_origins.pdf](http://www.psychology.sunysb.edu/attachment/online/inge_origins.pdf)
- Bremner, J. G. (2017). *An introduction to developmental psychology*. John Wiley & Sons.
- Güçlü, Mehmet et. al. 2016. *An Examination On The Personal And Social Adjustment Levels Of The Athletes According To The Gender, Age And Branch Variables*. *The Online Journal of Recreation and Sport – January 2016 Volume 5, Issue 1*
- Hong, Chia Swee.; Gabriel, Helen.; St. John. 2010. *Sensory Motor Activities for Early Development*. Specchmark Publisher Ltd.
- Indrawati, Maya dan Nugroho, Wido. 2006. *Mendidik dan Membesarkan Anak Usia Pra-Sekolah*. Jakarta: Prestasi Pustaka Publisher.
- Jarani et. al. 2015. *Effects of two physical education programmes on health- and skill-related physical fitness of Albanian children*. *Journal Of Sport Sciences*. Routledge Taylor & Francis. <http://dx.doi.org/10.1080/02640414.2015.1031161>
- Jürimäe, Toivo & Jürimäe, Jaak. 2000. *Growth, physical activity, and motor development in prepubertal children*. Washington DC: CRC Press.
- Kelly, Luke E. et. Al. 2010. *Everyone Can: Skill Development and Assessment in Elementary Physical Education*. Champaign IL.: Human Kinetics.
- Kurtz And Lisa A. 2007. *Understanding Motor Skills in Children with Dyspepsia, ADHAM, Autism, and Other Learning Disabilities: A Guide to Improving Coordination (KP Essentials Series) (KP Essentials)*. Jessica Kingsley Pub. ISBN 1-84310-865-8.
- Logan, S. W., Barnett, L. M., Goodway, J. D., & Stodden, D. F. (2017). *Comparison of performance on process-and product-oriented assessments of fundamental motor skills across childhood*. *Journal of sports sciences*, 35(7), 634-641
- Lowery, S. E., Kurpius, S. E. R., Befort, C., Blanks, E. H., Sollenberger, S., Nicpon, M. F., & Huser, L. (2005). *Body image, self-esteem, and health-related behaviors among male and female first year college students*. *Journal of College Student Development*, 46(6), 612-623.
- Marta, C. C., Marinho, D. A., Barbosa, T. M., Izquierdo, M., & Marques, M. C. (2012). *Physical fitness differences between prepubescent boys and girls*. *The Journal of Strength & Conditioning Research*, 26(7), 1756-1766.
- O'Regan, J. Kevin & Noe, Alva. 2000. *What it is like to see: A sensorimotor theory of perceptual experience* <http://nivea.psych.univparis5.fr/Synthese/MyinFinal.html>
- Payne, V. Gregory & Isaacs, Larry D. 2017. *Human Motor Development A lifespan Approach*. Ninth Edition. Routledge.
- Riduwan. 2012. *Belajar Mudah Penelitian Untuk Guru, Karyawan, Peneliti Pemula*. Bandung:

- Alfabeta
- Singh, Kuldeep. 2016. Role of physical education and sports in Indian prospective: An over view. IJPESH. P-ISSN: 2394-1685, E-ISSN: 2394-1693
- Su, Xiaoxia et. al. 2016. At-Risk Boys' Social Self-Efficacy and Physical Activity Self-Efficacy in a Summer Sports Camp. *Journal of Teaching in Physical Education*, 2016, Vol 35, 159 -168. Human Kinetic Inc.
- Sudjana. 2003. *Metoda Statistika*. Bandung: Tarsito Press.
- Supartini. Y. 2004. *Buku Ajar Konsep Dasar Keperawatan Anak*. Jakarta: EGC
- Tientje, Nurlaila N.Q. Mei dan Iskandar, Yul. 2004. *Pendidikan Anak Dini Usia Untuk Mengembangkan Multipel Inteligensi*. Jakarta: Dharma Graha Group.
- Thelen, E., & Bates, E. (2003). Connectionism and dynamic systems: Are they really different? *Developmental Science*, 6, 378–391
- Veldman, et. al. 2017. Promoting Ball Skills In Pre-school-Age Girls. *Journal Science and Medicine In Sport*. Vol. 20(2017). 50-54.
- Vella, Stewart A., et. al. 2015. The contribution of organised sports to physical activity in Australia: Results and directions from the Active Healthy Kids Australia 2014 Report Card on physical activity for children and young people. *Journal of Science and Medicine in Sport*, 2015
- Vlahov, Eric et. al. 2014. Preschool Motor Development Predicting High School Health-Related Physical Fitness: A Prospective Study. *Perceptual And Motor Skill*: 2014, (Published Manuscript) 119, 1, 279-291. ISSN 0031-5125
- Spencer, J. P., Perone, S., & Buss, A. T. (2011). Twenty years and going strong: A dynamic systems revolution in motor and cognitive development. *Child Development Perspectives*, 5(4), 260-266.
- Phillips, E., Davids, K., Renshaw, I., & Portus, M. (2010). Expert performance in sport and the dynamics of talent development. *Sports medicine*, 40(4), 271-283.
- Santrock, J. W., & Rollo, D. (2017). *Psicologia dello sviluppo*. McGraw-Hill Education.