

Development of Fine Motor Skills and Language in Infants Aged 6-12 Months at Puskesmas Karuwisi, Makassar City

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ABSTRACT

Infants are the age of newborns up to one year, who go through a process of development and growth. This process passes quickly, briefly, and cannot be repeated, so it is called the "golden period". In 2015, 16% of Indonesian children had problems with fine motor development. The study's purpose was to describe the development of fine motor and language in infants aged 6-12 months. This study was quantitative, with a descriptive approach. The population was 103 infants. The population was all mothers with infants aged 6-12 months who visited PUSKESMAS Karuwisi, Makassar City. The sample of this study was infants aged 6-12 months. The sampling technique used was purposive sampling. The sample number was 51 people. The tool used was the Denver Developmental Screening Test (DDST) Observation Sheet. The Findings showed that the most fine motor skills developments was normal category, as many as 42 (82.4%), and language development was normal category, as many as 39 (76.5%). We can conclude that the highest fine motor development of infants aged 6-12 months was normal category, and the highest language development of infants was normal category. It is hoped that every parent should provide the appropriate stimulation according to the infant's developmental stage.

Keywords: Development, Fine Motor, Language, Infants aged 6-12 months.

INTRODUCTION

Infants are newborns up to one year who go through a process of development and growth. Due to the short period of infancy, it is often called the "golden period."

The World Health Organization (WHO) reported that more than 200 million children under five years of age in the world did not fulfill their developmental potential, and most of them were children living in the continents of Asia and Africa 2018. Various children's development problems are increasing, such as delays in motor and language, uncertain behavior, autism, and hyperactivity. The incidence of developmental delays in the United States is around 12-16%, Thailand is 24%, and Argentina is 22%. While in Indonesia, it is 29.9%. According to UNICEF, in 2015, data was obtained that the incidence of growth and development disorders in children under five years old, especially motor development, reached 3 million infants (27.5%). National data from the Indonesian Ministry of Health shows that 13% - 18% of children under five in Indonesia had growth and development disorders in 2014 (World Health Organization (WHO)).¹

The Ministry of Health of the Republic of Indonesia reported that 0.4 million (16%) Indonesian children under five had motor development disorders, both gross and fine motor development. In Cibanten, Bogor, from the results of the study by Solihin et, al (2013), found that from 73 children, 54.8% of children were categorized as having low cognitive development.²

The Indonesian Pediatrician Association (IDAI) of Central Java 2010 examined 2,634 children from 0 – 72 months. The results of the development assessment according to age were 53% normal, doubtful (requires deeper examination) as much as 13%, and experienced deviations of 34%. The results of gross motor development are 10%, fine motor development is 30%, speech development is 44%, and socialization of independence is 16%. Based on the data above, the number of developmental deviations is quite large in Indonesia.³ Based on information from the South Sulawesi Provincial Health Office, there are around 160,777 infants.⁴ In 2015, 16% of children in Indonesia had impaired fine motor development.⁵ Based on target data in April 2021 at PUSKESMAS Karuwisi in Makassar City, showed that there were 3 villages in the Working Area of PUSKESMAS Karuwisi, those are Sinrijala Village with 38 infants, North Karuwisi Village as many as 78 infants, while Karuwisi village as many as 103 infants aged 6-12 months.

Development is a quantitative and qualitative change. Development is the increase in the ability to structure and function more complex in a regular and predictable pattern as a maturation process. Among the development, processes are fine motor development and language development. At the early stage of development, the child is at the sensory-motor stage. Providing visual stimulation to infants will increase their attention to their environment, and infants will be happy by laughing and moving their whole bodies.⁶ Based on Piaget's theory, "Jean Piaget" a biologist and psychologist from Switzerland, said that motor development is a cumulative process, in the sense that previous developments are the basis for subsequent development. Pass obstacles will affect the future. The factors affecting motor development consist of heredity, environment, and maturity of physical and psychological organs.⁷ Motor skills are divided into two, such as gross motor skills that relate to gross muscles and fine motor skills that connect smooth muscles. Activities carried out by children that involve gross and smooth muscles look very easy, but they need guidance and practice so they can move well and correctly.

Aspects of child development consist of several developments, such as social development, gross motor development, language development, and fine motor development. Fine motor skills are aspects related to the child's ability to observe something and perform movements that involve body parts and are carried out by small muscles but require careful coordination.⁸ For example, the infant will begin to put objects into containers, play with drums, hold stationery and scribble, play with toys that float in water, make sounds, hide and look for toys, arrange blocks and squares, draw, and play in the kitchen at the age of 6-12 months. Meanwhile, the language development skills for infants aged 6-12 months, such as they can name pictures in magazines, pointing a thing, and name pictures, imitate words, talk to dolls, humming and singing, and say ma-ma and pa-pa. Some may experience developmental delays, due to genetic or chromosomal disorders such as Down syndrome, infections of the nervous system such as cerebral palsy or CP, spina bifida, rubella syndrome, history of high-risk infants such as premature babies, low birth weight, children with severe illness in early life that requires intensive care and others. Here are the danger signs of cognitive impairment in infants aged 6-12 months, including the infant, has not been able to respond or search for the source of the sound, the infant has not been able to babble such as ma-ma, or pa-pa, and other meaningful words. The danger signs of developmental disorders in fine motor skills include the infant still grasping after 4 months, the presence of one-handedness before the age of one year, and oral exploration (such as putting a toy into the mouth) is still very dominant after the age of 14 months, and visual attention inconsistent. Other factors of developmental disorders are genetics, hearing loss, low intelligence, lack of interaction with the environment, late maturation, family factors, and psychological, stuttering due to pressure from parents to speak, cleft lips, and short tongue leading to disturbances of language.⁶

Humans as social beings who always communicate as part of life activities. According to the theory of cognitive development of Vygotsky, language is a particular part of the process of cognitive development. Chomsky (1957) stated that a human being had been equipped since birth with physical devices so that he is sensitive and recognizes linguistic devices or settings and features in the language. Chomsky called this device a Language acquisition device (LAD). Language development in babies includes crying and babbling from birth to six months. And then, being a specific language listener, using language and understanding words at the age of 6-12 months, the pronunciation of the first word,

and vocabulary explosions occur in the next phase up to 18 months, while at the age of 18-24 the development of speech understanding occurs rapidly, and began to say two words.⁹ Then the first years, children learn to listen. Verbal stimuli during this period are essential for language development. The quality and quantity of a child's vocals can be increased by stimulation I, and the child will learn to imitate the words he hears.⁶ Based on the description above, the researcher is interested in analyzing fine motor and language development aspects. Because this is the basis of children's development which affects their future.

RESEARCH METHOD

This study is quantitative, with a descriptive approach. This study uses the primary data collection method, consisting of fine motor development and language development.

This study was conducted on infants aged 6-12 months at PUSKESMAS Karuwisi, Makassar City. To measure fine motor and language development of infants by using the DDST Observation sheet (Denver Developmental ScreeningTest).

The data source consists of primary data and secondary data. Primary data was obtained by using the DDTS (Denver development screening test) sheet to determine fine motor and language development in infants aged 6-12 months. Secondary data was obtained from PUSKESMAS Karuwisi, where the data contained data on infants aged 6-12 months who visited in the last three months.

The stages of the study include a) All infants aged 6-12 months, especially mothers who bring their babies to PUSKESMAS. b) All mothers who take care of their babies without the help of caregivers or family. c) All mothers who are willing to become respondents. d) Selecting the study subject by purposive sampling. e) Measuring the fine motor and language development of infants aged 6-12 months: 1) The instruments of this study were carried out by using DDTS (Denver development screening test) sheets to determine the fine motor and language development in infants aged 6-12 months. The observation time was carried out for 15-20 minutes, then measured and recorded the results of infant motor development using the DDST sheet.

To analyze the description of fine motor and language development, a univariate analysis was carried out on each variable to obtain the frequency distribution and percentage of each variable using the statistical application of SPSS 16.

RESULTS AND DISCUSSION

Characteristics of respondents

Table 1. Frequency distribution of respondent characteristics on parents (mothers) who have infants aged 6-12 months

Variable	n	%
Age of parents (mother)		
19-25 Years old	17	33,3
26-30 Years old	23	45,1
31-42 Years old	11	21,6
Knowledge		
Sufficient	41	80,4
Less	10	19,6
Occupation		
Unemployed	42	82,4
Civil servant	3	5,9
Employee	5	9,8
Entrepreneur	1	2,0
Total	51	100,0

Based on table 1, based on the characteristics of the age of parents (mother), the highest percentage was 26-30 years old, as many as 23 (45.1%). Based on the characteristics of parents' knowledge, the highest was sufficient category, as many as 41 respondents (80.4%). Based on the characteristics of the job, the highest was unemployed, as many as 42 respondents (82.4%).

Characteristics of Sample

Based on table 2, the age of the infant from 6-12 months at PUSKESMAS Karuwisi, Makassar City, the highest was 12 months old with 11 infants (21.6%). Based on the characteristics of gender, the highest was male with 28 infants (54.9%). Based on the order of birth, the highest was the first child as many as 25 infants (49.0%).

Table 2. Frequency distribution based on characteristics of sample

Variable	n	%
Age of Infant		
6 months	9	17.6
7 months	6	11.8
8 months	7	13.7
9 months	10	19.6
10 months	2	3.9
11 months	6	11.8
12 months	11	21.6
Total	51	100.0
Gender		
Male	28	54.9
Female	23	45.1
Order of birth		
The second child	16	31.4
The third child	10	19.6
The first child	25	49.0
Total	51	100,0

Univariate analysis test

Tabel 3. Frequency distribution based on Fine Motor and Language Development

Variable	n	%
Fine motor development		
Faster	4	7.8
Normal	42	82.4
Late	5	9.8
Language development		
Faster	7	13.7
Normal	39	76.5
Late	5	9.8
Total	51	100.0

Table 3. Based on the distribution of 51 samples, the highest category of fine motor development was normal category, as many as 42 infants (82.4%). while the lowest was the faster category, as many as 4 infants (7.8%)/ The highest language development was normal category, as many as 39 infants (76.5%).

DISCUSSION

Fine Motor Development

Motor development is the development of coordination of the central nervous, peripheral nerves, and muscles.⁷ Growth is the capacity increase in the structure and functions of the body to be more complex in an orderly and predictable pattern, as a result of the mature process.⁵

Fine motor development is a child's ability to use small muscles, coordinate between eyes and hands, and do independent activities well. One of the causes of suboptimal fine motor development is the lack of stimulation by parents or through their toys. Stimulation is an activity stimulating children's basic abilities, so they can grow and develop well. Every child needs to get regular stimulation as early as possible and continuously. Delays in fine motor development are caused by a lack of stimulation.¹⁰

Family is the first social environment and the first learning medium in the child's life. Parents, both father, and mother, have their respective involvements in supporting the development of children. However, in practice, mothers have a bigger role than fathers because mothers are the first individuals to interact with children at birth and have more time to interact and provide stimulation because while breastfeeding their children, mothers can stimulate them to support the optimal development and reduce the rate of delay in development.¹¹ Based on the findings, more mothers were at home or unemployed, as many as 42 respondents (82.4%) with normal infant fine motor development.

The findings showed that the highest fine motor development of infants aged 6-12 months was in the normal category, as many as 42 infants (82.4%), while the lowest was in the faster category, as many as four infants (7.8%). It is in line with a study conducted by⁷ that there is a relationship between the use of APE (p-value=0.001), nutritional status (p-value=0.001) and history of exclusive breastfeeding (p=value=0.002), and motor development in children aged

3 - 5 Years at Satria kids center Bekasi in 2020. It is also in line with the study conducted by Intan Febriyanti (2019), which showed the results of statistical tests with p -value of 0.001. Children who are stimulated will develop faster than children who are less or even those who do not get stimulation.⁷

Based on the knowledge of parents, especially mothers, the most results were 41 (80.4%), and based on the parents' occupation, especially mothers, the highest result was unemployed, as many as 42 (82.4%). The researcher assumes that an unemployed mother will have more time with their child, and a mother with sufficient knowledge will pay attention to growth and development by providing optimal motor stimulation according to age. Most results of fine motor development were in the normal category. It is supported by the results of a study conducted by², which shows a very good relationship between mothers' knowledge, parenting patterns, and nutritional status with children's gross motor skills.¹²

The researcher assumes that if the mother's education is sufficient, the mother will be more motivated to provide stimulation to their child. It is in line with the results of a study conducted by Nasir (2021) found that most of the respondents had sufficient knowledge 25 respondents (56.8%), adequate parenting as many as 23 respondents (52.3%), normal child development as many as 39 respondents (88.6%). The results of the study were $p = 0.042$, where H_1 is accepted, and H_0 is rejected, which means that there is a relationship between knowledge and development of preschool children at Posyandu in the working area of PUSKESMAS Sangurara, Palu City (Nasir & Umar, 2021). In the study results, 5 (9.8%) children experienced developmental delays. The researchers assumed that there was a possibility of delays due to the lack of parental attention in providing stimulation to their children, parents who were busy at work, had less time with their children and had inadequate nutrition to support the development process. It is in line with a study conducted by Alfarizi, in the city of Palembang, which concluded that the less fulfilled nutritional status, the less the children will be developed.¹³

According to Hurlock (2016), stimulation determines the quality of human brain cells, even in the womb. Indiaarti (2017) adds that stimulation affects child development. According to Desmita (2015), through the five senses, children get information about the physical condition and environment around them. The sensory information will be received by the brain not only through the eyes, ears, and nose but the entire body. The children can achieve optimal development in vision, hearing, language development, social, cognitive, gross movement, fine, balance, coordination, and independence.¹⁴

According to Stern (1985), the mental health of parents, especially mothers, and the quality of mother-infant dyadic interaction form the proximal early environment for infant development. Several studies confirm that the mother's good mental health and safe dyadic interactions promote optimal cognitive, sensorimotor, and socio-emotional. Meanwhile, depression, stress, family violence, and environmental insecurity can create severe risks for optimal child development.¹⁵

Based on the theory, children's motor development can be determined by genetic, social, and environmental factors that interact with each other in a complex manner. In this context, children may receive protection or live with developmental risks. The risk factors most associated with motor domain delay are poor socioeconomic conditions, the low intellectual level of parents, prematurity, and lack of stimulation at home. The literature shows that gestational and postpartum depression can harm both mother and child. Depressed mothers tend to be less sensitive and less available to their children's needs, and they also tend to stimulate their children. According to Piccinini et al. (2014), depressed mothers are apathetic, interact little, and are not very warm with their infant, but sometimes they are distracting. It makes the child's will not explore the environment and impacts the development and improvement of motor skills..¹⁶

Language development

Language is an aspect of children's development that plays an essential role in life so that they can use the language both passively and actively to communicate effectively.¹⁴ Early detection of child growth and development is an activity or examination to find early developmental deviations. If the deviation is detected too late, then the intervention will be hampered and impact the child's development.¹

In the first five years of life, the stages of evolution in communication can be grouped into three periods or three parts. The first period begins when infants communicate through cries, eye gaze, vocalizations, and early movements. This early communicative behavior is not intentional but sets the stage for later communication. In the second period, from six to 18 months, the infant's communicative involvement with adults becomes deliberate. The main turning point is the co-arising of attention, which involves the infant coordinating visual attention with others about objects and events. In the third period, from the next 18 months, language takes over as the primary tool for children's learning and communication. For example, preschool children can engage in conversations about emotions that take into account the affective states of others, can use language for self-control, and can negotiate verbally.¹⁷

The study results showed that the highest category of language development in infants aged 6-12 months was normal, as many as 39 children (76.5%), while the lowest was late, as many as five children (9.8%). This is in line with the results of study conducted by¹⁴, which showed that language development was normal at 81.3%, high stimulation at 61.3%, positive parenting at 78.7%, and female gender at 65.3%. The results of the bivariate analysis showed that there was a significant relationship between stimulation ($p=0.000$), parenting style ($p=0.000$), and gender ($p=0.014$) with

language development in early childhood. The highest opportunity for language development is the parenting style factor, with an OR value of 41,067.¹⁴

According to Hidayat (2016), through tactile, audio, visual, and verbal stimulation from an early age, children can explore their natural surroundings, and their sensory, motor and auditory development will quickly develop. Soedjatmiko (2018) explained that factors that influence children's development are stimulation from parents because parents interacting with children will develop children's abilities according to their developmental age. The stimulation must be routine and continuous with love, play methods, etc. so that children's development will run optimally.¹⁴

Stimulation is an activity that stimulates the basic abilities of children to develop optimally. Every child needs regular stimulation as early as possible and continuously at every opportunity. Stimulation is carried out by parents, especially mothers who are the closest people to children. Lack of stimulation causes deviations in child development and even permanent disorders (Ministry of Health RI 2017). Stimulating children's growth and development should be based on a sense of love and affection, always showing a matter and gradual attitudes and behavior, and appraising their success.¹

The findings showed that the most gender was male, as many as 28 (54.9%), and the lowest was female with 12 (45.1%). In line with the study conducted by Holy (2018), gender is related to language development. In utero, boys experience a surge in testosterone and make their brains develop differently from girls' brains. Study shows that the higher the testosterone level is exposed, the more likely they are to be impulsive. The part of the brain that controls movement and coordination (the cerebellum) grows more quickly in boys. While the part of the brain of girls that controls the five senses, such as sight and hearing, is more sensitive than boys. The same study by Linda (2017) found a relationship between gender and language development. Girls speak faster than boys, whereas girls have more vocabulary.¹⁴

The results show that the highest maternal age category is 26-30 years, with as many as 23 people with a percentage (45.1%), and the lowest age is 31-42, with 11 people (21.6%). Based on the birth order, the highest was the first child, as many as 25 infants (49.0%), and the lowest was the third child, as many as ten infants (19.6%). Researchers assume that most children's language development is in the normal category at PUSKESMAS Karuwisi, Makassar City, because the sufficient knowledge of parents, especially mothers, because the higher mother's knowledge, the higher the chance to gain specific information about the child's development. And a mother with good knowledge will be motivated to provide stimulation to their children so that the growth and development of their children will be optimal. Mothers who are young and have their first child tend to focus on paying attention to their child's developmental needs.

CONCLUSIONS AND SUGGESTIONS

Based on the results of the analysis and discussion of the description of fine motor and language development in infants aged 6-12 months at PUSKESMAS Karuwisi, Makassar City, it can be concluded as follows:

1. Based on the results of the frequency distribution, the highest category of fine motor skills development was normal category, as many as 42 infants (82.4%). While the lowest is the faster category with 4 infants (7.8%).
2. Based on the results of the frequency distribution, the highest language development was normal category, as many as 39 children (76.5%). While the lowest was the late category, as many as 5 children (9.8%).

For nursing implication it is hoped that the results of this study can be a reference to add information about fine motor and language development in infants and can be controlling motor development in children.

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