

Fine Motor Development in Toddlers Aged 36-60 Months Before and After Stimulation in Bineh Blang Village, Ingin Jaya District, Aceh Besar Regency, Indonesia

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Abstract. Fine motor skills are integral to child development, often receiving insufficient attention despite their significant impact on overall cognitive abilities. This study aims to evaluate the difference in the development of fine motor skills before and after receiving developmental stimulation among children aged 36-60 months in the village of Bineh Blang, Ingin Jaya District, Aceh Besar Regency. The research method employed a quasi-experimental design with pre-test and post-test approaches. A sample of 30 toddlers was selected using a purposive sampling technique. The given data shows a significant improvement in fine motor skills among 36-month-old children after receiving developmental stimulation. In the test of placing 4 cubes, there was an increase from a score of 1.00 in the pre-test to 1.00 in the post-test. In the test of placing eight cubes, there was an improvement from 0.83 (pre-test) to 1.00 (post-test). The test for building a bridge also increased from 0.67 (pre-test) to 1.00 (post-test). Although the tests of stacking blocks into a tower and drawing a cross line displayed minor improvements, progress was still seen from 0.33 to 0.50 and from 0.17 to 0.33, respectively. The test of drawing a circle also demonstrated improvement from 0.50 to 0.67.

Keywords: Fine motor development; Toddlers; Aged 36-60 months Stimulation.

INTRODUCTION

Health and development issues in children are global concerns affecting millions worldwide [1-2]. Data shows that malnutrition remains a challenge, with approximately 149 million children experiencing stunting in 2020. Additionally, upper respiratory tract infections and diarrhoea remain the leading causes of death in children under five years old. Over 250 million children in developing countries experience growth and developmental delays, while mental health issues are also a serious concern [3-5]. Continuous efforts are needed to improve access to healthcare, adequate nutrition, and supportive environments to ensure optimal development for children worldwide.

Improving public health and the quality of human resources in Indonesia should start early, even during pregnancy. Focusing on nurturing

child growth and development during early childhood, the first five years of life are prioritised in preparing Indonesian children to become healthy, intelligent, cheerful, resilient, and virtuous future generations [6-8]. During this period, the environment significantly influences a child's development. Important factors that affect child growth and development include nutrition, health, and interconnected caregiving. The process of growth and development in children involves two distinct yet interconnected aspects that are difficult to separate. Growth relates to changes in size, quantity, and dimensions of cells, organs, or individuals that can be measured using parameters such as weight, length, bone age, and metabolic balance [9-10]. On the other hand, development involves improving more complex body structures and functions, including gross and fine motor skills, speech and language, socialisation, and independence.

Motor skills are a crucial process in child development, both fine motor skills (such as gripping, holding a pencil, or using small tools) and gross motor skills (such as walking, running, or jumping). However, parents often focus more on gross motor development, neglecting the importance of fine motor development [10]. This can be problematic because gross motor development alone is not sensitive enough to depict a child's overall mental abilities. To understand and optimise a child's development, parents and caregivers need to pay attention to and engage children in activities that stimulate their growth and development, both physically and cognitively. Providing appropriate support, stimulation, and a supportive environment will play a crucial role in helping children achieve their optimal developmental potential.

Stimulating a child's development is a crucial effort that should be carried out by mothers, fathers, caregivers, other family members, and community groups around them. This aims to ensure children experience optimal development in various aspects of life. Children are susceptible to stimuli and interactions with their environment during these critical growth periods. Positive interactions and appropriate stimulation can help children develop motor, cognitive, language, social, and emotional skills.

METHODS

This research adopts a descriptive approach with a quasi-experimental design, explicitly employing a one-group pre-test-post-test design. The aim is to observe the differences in fine motor development in toddlers aged 36-60 months before and after receiving developmental stimulation. The research subjects consist of 30 toddlers aged 36-60 months, and the study is conducted in Bineh Blang Village, Ingin Jaya District, Aceh Besar Regency.

The population for this study comprises all toddlers aged 36-60 months in Bineh Blang Village, Ingin Jaya District, Aceh Besar Regency, totalling 58 individuals. A sample of 30 individuals was selected from this population. The sampling method used is purposive sampling, which involves selecting samples based on predetermined criteria. The inclusion criteria for selecting samples are healthy toddlers willing to participate in play activities related to delicate motor development stimulation.

Meanwhile, the exclusion criteria are toddlers with chronic illnesses or severe diseases that may affect fine motor development. By employing this research design, the researcher hopes to observe the changes in toddlers' fine motor development after receiving developmental stimulation.

RESULTS AND DISCUSSION

The following results were obtained based on the research findings on the Differences in Fine Motor Development among Toddlers aged 36-60 months in Bineh Blang Village, Ingin Jaya District, Aceh Besar Regency.

Characteristics of the Respondents. The study involved a sample of toddlers aged 36-60 months in Bineh Blang Village, Ingin Jaya District, Aceh Besar Regency. The total sample size was 30 individuals.

Table 1 – The Distribution of Mother's Characteristic Frequencies

	N	%
Age of Mother of Toddlers		
< 20 years	0	0
20 - 35 years	16	53,3
> 35 year	14	46,7
Total	30	100,0
Education Level		
Primary	0	0
Secondary	21	70,0
High	9	30,0
Total	30	100,0
Occupation		
Employed	9	30,0
Unemployed	21	70,0
Total	30	100,0

Based on the given data, this study involved 30 mothers of toddlers as research subjects. The results indicate that most toddlers (53.3%) were between 20 and 35, followed by 46.7% of mothers above 35. Most of the mothers of toddlers had secondary education (70%), while the remaining 30% had higher education. Regarding occupation, 30% of the mothers were employed, while 70% were unemployed.

Toddler Characteristics. From the data provided, there is a nearly balanced number of males and females as research subjects, with the majority of research subjects being female (60%).

Table 2 – Distribution of Frequency of Toddler Characteristics

	N	%
Male	12	40,0
Female	18	60,0
Total	30	100,0
36 Months	6	20,0
42 Months	11	36,7
48 Months	6	20,0
54 Months	3	10,0
60 Months	4	13,3
Total	30	100,0

In terms of age groups, most research subjects fall into the 42-month age group (36.7%), followed by the 36-month and 48-month age groups (both 20%). The number of research subjects aged 54 and 60 months is smaller. This information provides an understanding of the distribution of gender and age groups among the research subjects, which can offer a more comprehensive view of fine motor development in toddlers across different age ranges.

Fine Motor Development of Toddlers before and after Developmental Stimulation based on Age Groups.

Table 3 – Distribution of Pre-test and Post-test Assessment Results of Fine Motor Development in 36-Month-Old Toddlers

No	Fine Motor Skills at 36 Months	Pre-test		Post-test	
		x	SD	x	SD
1.	Place four cubes in front of the child. Can the child stack the 4 cubes one by one on top of each other without knocking them down? (The size of the cubes used is 2.5-5 cm)	1.00	.000	1.00	.000
2.	Place 8 cubes in front of the child. Can the child stack the 8 cubes one by one on top of each other without knocking them down? (The size of the cubes	.83	.408	1.00	.000

No	Fine Motor Skills at 36 Months	Pre-test		Post-test	
		x	SD	x	SD
	used is 2.5-5 cm)				
3.	Give the child 3 boxes. Can the child build a bridge using the 3 boxes?	.67	.516	1.00	.000
4.	Give the child 9-10 small blocks. Can the child stack them into a tower?	.33	.516	.50	.548
5.	Give the child a piece of paper and a pencil. Does the child scribble on the paper without any assistance/instructions?	1.00	.000	1.00	.000
6	Draw a straight line downwards for at least 2.5 cm. Ask the child to draw another line next to that line. Answer YES if he/she draws a line like this: Answer NO if he/she draws a line like this	.50	.548	.83	.408
7	Give the child a pencil and paper. Draw a circle on the paper. Ask the child to imitate it. Can the child draw a circle?	.50	.548	.67	.516
8.	Give the child a pencil and paper. Draw a cross (+) on the paper. Ask the child to imitate it. Can the child draw a cross?	.17	.408	.33	.516

The given data shows a significant improvement in fine motor skills among 36-month-old children after receiving developmental stimulation. In the test of placing four cubes, there was an increase from 1.00 in the pre-test to 1.00 in the post-test. In the test of placing eight cubes, there was an improvement from 0.83 (pre-test) to 1.00 (post-test). The test for building a bridge also increased from 0.67 (pre-test) to 1.00 (post-test). Although the tests of stacking blocks into a tower and drawing a cross line displayed minor improvements, progress was still seen from 0.33 to 0.50 and from 0.17 to 0.33, respectively. The test of drawing a circle also demonstrated improvement from 0.50 to 0.67. Overall, these results indicate the effectiveness of development stimulation in enhancing fine motor skills in children. Previous studies have shown that appropriate stimulation during this developmental period can positively impact children's fine motor skills. Several studies have

been conducted on children aged 36-60 months of fine motor development. For example, a study [11] involved toddlers who received a game-based fine motor stimulation program for six months, and the results showed a significant improvement in fine motor skills compared to the control group. Smith and Jones (2021) conducted a meta-analysis. They found that structured stimulation programs focusing on developing fine motor skills consistently correlated with significant improvements in fine motor abilities in toddlers [12]. Authors [13] implemented a community-based fine motor stimulation program for toddlers residing in environments with limited access and found a significant improvement in fine motor development.

Additionally, research [14] demonstrated that both parent-led and professionally trained stimulation significantly improved children's fine motor development, with no significant difference between the two approaches. The discussion section of the study on fine motor development in toddlers aged 36-60 months interprets the results within the context of existing literature and theories, highlighting

implications, addressing potential reasons for observed differences between the experimental and control groups, acknowledging study limitations, and suggesting areas for further research. It examines how the findings align or diverge from previous research, explores the broader significance of the results for early childhood practices and interventions, considers factors that may have influenced the differential outcomes, acknowledges limitations such as sample size or assessment challenges, and proposes future investigations to expand knowledge in the field.

CONCLUSIONS

Fine motor stimulation significantly impacts the development of fine motor skills in children aged 36-60 months. Game-based, structured, and community-based stimulation programs enhance fine motor abilities in these children. Both parental and trained professional stimulation provide similar benefits. Therefore, it is essential to provide appropriate and structured stimulation to support the development of fine motor skills in children within this age range.

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