



Original Research

Utilization of Fine Motor Stimulation Media "Activity Book" for Stunting Toddlers

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Abstract

Stunting conditions in toddlers affect physical performance and mental and intellectual functions to be disrupted. One of the efforts to avoid developmental delays in stunted toddlers requires an active role by the toddler's mother in providing stimulation. This study aimed to analyze the differences in toddlers' fine motor development before and after stimulation using activity book media. This study used a one-group pretest-posttest design. The population in the study were toddlers who had been diagnosed with stunting in Sambas Regency, West Kalimantan, totaling 374 toddlers. Samples were taken using a cluster sampling technique in the Working Area of Puskesmas Tebas and Puskesmas Sekura, a total of 60 toddlers aged 24-36 months diagnosed with stunting. The research instrument was an "activity book" with 12 exercises. Hypothesis testing using the Wilcoxon Test after obtaining an abnormal data distribution in the data normality test. The findings of this study received the results p-value (0.000) <0.05. There were differences in the fine motor skills of stunted toddlers before and after being given stimulation using activity books.

Keywords: Activity Book, Stimulation, Fine Motor, Stunting

INTRODUCTION

Stunting is a condition where a person's height is shorter than other people of the same age. Based on proxy measures of stunting and poverty, 250 million children (43%) under five years old in low- and middle-income countries are at risk of not achieving optimal development (Black et al., 2017). The results of Riskesdas in 2018 show that the prevalence of stunting in Indonesia reached 19.3%, which means that about 57 thousand Indonesian children experience stunting (Riset Kesehatan Dasar, 2018). According to the Pontianak Health Office report in 2020, 33.29% of toddlers were stunted, making West Kalimantan the fifth highest in Indonesia. Data obtained from Sambas Regency in 2021 shows that around 10.6% or around 1321 toddlers were diagnosed with stunting.

The high prevalence of stunting is caused by various factors, namely non-exclusive breastfeeding in the first six months, low household socioeconomic status, premature birth, short birth length, and maternal education, which are determinants of child stunting in Indonesia (Beal et al., 2018). In addition, environmental factors such as inappropriate latrines and untreated drinking water are also at higher risk of stunting.

Children's motor skills development involves two main components, namely gross motor skills and fine motor skills. Gross motor skills involve movements that engage larger

muscle groups like walking, running, two-footed jumping, and overcoming obstacles. On the other hand, fine motor skills utilize smaller muscles for activities such as cutting, pasting, drawing, coloring, writing, and building with blocks. Children with limited fine motor skills can enhance their abilities through activities like folding, molding, and various exercises. Typically, the contrast between gross motor and fine motor skills is evident in their coordination and biomechanics (Komaini & Mardela, 2018). Child stunting is the result of nutrient deficiencies during the first thousand days of life. Children with early stunting are more behind in cognitive and fine motor aspects, which are the most critical support for children's learning and education in the future (Permatasari & Sumarmi, 2018). Early detection of developmental deviations can be done with Screening / Examination of child development using the Denver Developmental Screening Test (DDST) to determine if the child's development is normal or if there are deviations.

Undernutrition in stunted children affects the brain, which is involved in cognition, memory, and leukomotor skills. The brain has large energy requirements in childhood, and most brain growth occurs in the first two years of life. In addition, malnutrition, micronutrient deficiencies (especially iron), recurrent infections, apathy, reduced exploration, poverty, low maternal education, and decreased stimulation often coexist in the same household and are all likely to affect child development (Prendergast & Humphrey, 2014). Fine motor skills and independence in children who are not stunted are higher than those in children who are not stunted (Meylia et al., 2022). Partially, the development of stunted toddlers affects personal social, fine motor, language, and gross motor, and simultaneously, stunting variables are related to child development (Zakiyya et al., 2021).

Developmental disorders in children under five years old lead to several possibilities, including speech delays, sensory disorders, auditory nerve disorders, Down syndrome, and autism. The prevalence of child development disorders has been found in more than 250 million children under five in low- and middle-income countries (Urke et al., 2018). The home environment and parent-child interactions, especially for toddlers, have an important role in motor development, as toddlers are highly dependent on parents in daily functions and activities to facilitate their growth and development (Rokach, 2016). The activity book media is designed as a game stimulation medium that parents can use at home, as explained by the fact that games are a form of developmental stimulation (Suryani et al., 2021).

Providing "activity books" is one solution for fine motor stimulation of stunted toddlers because activity books can provide a variety of sensory and motor stimulation that involves the use of hands, fingers, and eyes. Through activities such as coloring, drawing (Jumiyati et al., 2023), cutting, pasting, and assembling, activity books can help train eye-hand coordination, finger strength, and other fine motor skills that are important for child development. By providing fine motor stimulation through activity books, stunted children can engage in activities that stimulate the growth and development of their fine motor skills in a fun and interactive way (Rukmini et al., 2022).

METHODS

This study used a one-group pretest-posttest design. The variables of this study were the use of activity books as the dependent variable and fine motor skills as the dependent variable. The population was toddlers who had been diagnosed with stunting in Sambas Regency, West Kalimantan, totaling 374 toddlers. The sample was taken using a cluster sampling technique in the Focus Location Area (Lokus Stunting) of Puskesmas Tebas and Puskesmas Sekura, a total of 60 toddlers aged 24-36. This research has gone through an ethical

clearance process based on the number 40/KEPEK.PK.PKP/III/2022, dated March 8, 2022, by the Health Research Ethics Commission of the Poltekekes Kemenkes Pontianak.

The instrument in this study was an activity book that has 12 training activities. Fine motor stimulation activities consist of drawing, cutting, sticking, and assembling; activity books can help train eye-hand coordination and finger strength. Before the activity book was given to mothers, toddlers were first assessed for fine motor development by researchers, then stimulated and reassessed by researchers after four weeks. For four weeks, the toddler's mother provides stimulation independently at home using the media. The development of the media was based on the Guidelines for Stimulation Detection Intervention of Growth and Development (SDIDTK)(Kemenkes RI, 2016). Data analysis used univariate analysis continued with bivariate analysis using the t-test, which has been tested for data normality with the Kolomogorov-Smirnov test. The Wilcoxon test was used as an alternative test if the data normality test results were not normally distributed.

RESULTS

Based on Table 1, all exercise stimulation in the activity book for four weeks by stunting toddlers showed an average increase in their ability in fine motor stimulation. The data shows the level of significance of all exercises in the activity book. There was a significant difference after exercise, pvalue 0.000 using the Wilcoxon test.

Table 1. Frequency distribution of fine motor stimulation of stunted toddlers

Activity book's Exercises	Intervention (n=60)				
	Mean Pretest	Mean Posttest	SD	t	p-value*
Exercise 1: Matching pictures	2,666	3,216	0,723	0,550	0,000
Exercise 2: Space stimulation	2,616	3,400	0,640	0,784	0,000
Exercise 3: Sorting Colors	2,533	3,433	0,817	0,900	0,000
Exercise 4: Attach animal eyes (1cm diameter)	2,466	3,300	0,762	0,834	0,000
Exercise 5: Sticking the ice cream puzzle	2,016	3,133	0,884	1,117	0,000
Exercise 6: Pointing and pasting body part puzzles	2,250	2,966	0,715	0,716	0,000
Exercise 7: Thickening and connecting lines	2,833	3,083	0,671	0,250	0,000
Exercise 8: Putting together animal puzzles	2,183	3,183	0,736	1	0,000
Exercise 9: Sticking apples on trees	2,116	3,066	0,648	0,950	0,000
Exercise 10: Sticking on and counting buttons	1,783	2,983	0,819	1,200	0,000
Exercise 11: Thickening the lines	2,166	2,983	0,503	0,817	0,000
Exercise 12: Sticking the color puzzle	2,983	3,183	0,645	0,2	0,000

Data source: Primer data

*Wilcoxon test

The normality testing results indicate that in week one stimulation, the p-value obtained was 0.009, which is less than the significance level of 0.05. This suggests that the variable was not normally distributed. Similarly, in week four stimulation, the p-value obtained was 0.00, also less than the significance level of 0.05. Therefore, it can be concluded

that the data could not be further analyzed using the paired T test. To assess the impact of utilizing activity books, the Wilcoxon Test will be employed based on the obtained outcomes.

The research hypothesis was tested using the Wilcoxon signed rank test, which is a non-parametric statistical method. This analytical technique was a method employed to compare the mean of two variables within a group. This indicates that the analysis was valuable in examining two correlated samples or two paired samples with non-normally distributed data. The Wilcoxon signed rank test is a non-parametric approach used to determine if there is a significant difference between two variables. Table 2 displayed the test results.

Table 2. Data Wilcoxon Signed Ranks Test Results

	Initial stimulation (pre-test)	Four weeks after stimulation (post-test)	p-value
Fine motor stimulation	27,45 (19-37)	37,68 (32-46)	0,000

The findings of the Wilcoxon signed ranks test comparing the assessment results before and after stimulation using the activity book indicated a significant difference. The Asymp. Sig (2-tailed) value was 0.000, which is less than 0.05. The results indicate there were disparities in the fine motor abilities of stunted toddlers before and after the provision of stimulation through activity books.

DISCUSSIONS

Based on the research data above, the utilization of activity books for stimulation of fine motor growth and development in stunting toddlers is proven to have a significant difference after stimulation. In line with previous findings, stimulation interventions for toddlers have significant benefits for overall child development (Yousafzai et al., 2016). The development of fine motor aspects is based on the concept of motor development, which consists of four aspects that must be developed, namely, strength, flexibility, coordination, and agility. These four aspects of motor development in its development in order to pay attention or stimulate it must be tiered and gradual starting from training strength, increasing training the flexibility of fine motor muscles (Astini et al., 2017).

Stimulation using activity books significantly improved fine motor function. According to research findings, the recovery of fine motor function requires more than just muscle recovery; more integration of muscle and brain function through a gradual process of overall recovery (Abessa et al., 2019). During the golden period of growth (1-3 years), toddlers who are given stimulation significantly affect the development of the toddler's brain (Akbar & Awalludin, 2020) where the brain tissue of toddlers who get a lot of stimulation develops up to 80% by the age of 3 years (Bryan Kolb, Ian Wishaw, G. Campbell Teskey, 2019). The results of previous research support this, stating that the earlier a child gets stimulated by parents, the more effective it is in improving children's cognitive development (Tucker-Drob & Harden, 2012).

The importance of parental involvement in providing stimulation has an impact on the development of toddlers, especially stunted toddlers who are at risk of developmental delays. A community-based randomized control group trial in Pakistan showed that children who received responsive stimulation had significantly higher developmental scores on cognitive,

language, and motor scales at 12 and 24 months of age compared to children in the control group (Yousafzai et al., 2014).

Various kinds of stimulation that can be given to toddlers, including patterning activities, sorting shapes, and classifying objects, can be done through puzzle games that are proven to be able to improve cognitive abilities in toddlers (Chen, 2011). The activity book is one form of Educational Game Tools (APE) that can optimize child development, which can be adjusted according to the age and developmental level of the child (Astini et al., 2017). Fine motor stimulation provided through activity books can direct children to learn and play, training them to make movements that involve fingers and eye-hand coordination actively. Continuous stimulation with busy binders will stimulate the growth and strength of neuron cell networks in the child's brain and have an impact on fine motor development. Conversely, a lack of stimulus can inhibit brain growth (Pangesti et al., 2019).

Activity books can affect the improvement in adaptability in children (Nugrahani, 2021). Activity books are developed to support the implementation of the child's learning process so that activities take place well and are meaningful and fun for children, which can be done by parents at home as well. In addition, this activity book is one of the media that can influence the improvement in adaptability in children's learning that is edutainment and interactive, so that it can trigger curiosity in children (Hikariza & Sihombing, 2014). By providing a structured yet flexible means for children to explore and develop these skills at their own pace, stimulating busy books can be a valuable resource for parents, caregivers, and educators working with stunted children.

CONCLUSIONS

Activity books serve as a means to stimulate fine motor skills in toddlers. Stunted toddlers exhibit disparities in their fine motor skills both before and after to receiving stimulation through the use of activity books. Comparable activities can be conducted for toddlers who have experienced stunted growth in order to enhance their fine motor.

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