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## **The influence maternal role in the stimulation of puzzle therapy and identification of animal sounds on the cognitive development of stunting children at toddler age**

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**Abstract**---Backgrounds: Stunting is a condition in which a child is shorter than his age. Stunting can have a negative impact on children's development, namely children's cognitive development becomes hampered. Role of mother become important in providing stimulation to the cognitive development of stunted children under

five. The role of the mother here is to provide stimulation of cognitive development through educational games. The purpose of this study was to determine the effect of maternal role in puzzle therapy stimulation and identification of animal sounds on the cognitive development of stunted children under five. Methods: Quasy-experimental research design. The sampling technique used was simple random sampling on 28 stunting children aged 3-5 years in the Kenjeran Public Health Center Surabaya. The independent variable is puzzle therapy and identification of animal sounds and the dependent variable is the cognitive development of stunted children under five. The instruments used are DDST and standard operating procedures for puzzle therapy and animal sound identification. Data analysis was performed using the Wilcoxon and Mann Whitney test with significant ( $p = 0.05$ ). Results: The result shows that there is an influence of maternal role in puzzle therapy stimulation and identification of animal sounds on the cognitive development of stunted children under five in the stunting group ( $p = 0.001$ ) and there are differences in cognitive development of stunted children under five in the intervention group and the control group ( $p = 0.001$ )  $0.000$ ). Conclusion: There is an effect of maternal role in puzzle therapy stimulation and identification of animal sounds on the cognitive development of stunted children under five. The research suggestions are that in addition to providing good nutrition for children, the role of mothers is needed in providing educational games so that the cognitive development of stunting children can develop optimally.

**Keywords**---educational games, mother's role, stunting, toddler children, cognitive development.

## Introduction

WHO (2018) stated that currently the world is faced with the issue of malnutrition that threatens health, especially in low- and middle-income countries. If the child has a history of chronic malnutrition, it will be at risk for stunting. *Stunting* is a condition of a child who has a height below the average for his age caused by chronic or repeated nutritional intake and is usually associated with poverty, health, poor maternal nutrition, children are often sick, as well as inappropriate feeding and care in early life. The severity of stunting is closely related to the inhibition of children's cognitive and motor development, so that the worse the degree of stunting in children will certainly have a bad impact on the child's cognitive and motor development. (Arini et al., 2019). External factors that affect the growth and development of early childhood are the environmental factors of parenting and interaction or Maternal Role Identity in children which are very important to influence the growth and development of children (Rhipiduri & Miming, 2016). Achievement of Maternal Role Identity is an interaction and developmental process that occurs during mother's contact with her baby which requires competence in carrying out the task of caring for children. Mothers can express satisfaction, pleasure, and attachment to their children while carrying out their role as mothers (Alligood, 2014).

Estimated prevalence of stunting in children under 5 years of age in the world in 2020 according to a report compiled by UNICEF, WHO, and World Bank (2021), which is about 22% or 149.2 million. This fact shows that stunting is still a health issue that must be considered, because the stunting rate target in the world in 2025 based on the Global Nutrition Targets 2025: Stunting Policy Brief (2014) is 100 million children. Factors causing stunting include inadequate nutritional intake, inappropriate parenting, heredity factors, toddlers do not receive early initiation of breastfeeding from their mothers and lack of exclusive breastfeeding, lack of sanitation, low birth weight of babies, and mothers experiencing anemia when pregnant (Ernawati, 2020). The level of education and knowledge of parents is also at risk of having a child with stunting because it is related to the higher education and knowledge that parents have, the easier it is for parents to receive all information related to nutrition management and good parenting. (Rahayu et al., 2018).

A nurse can act as a motivator and facilitator to parents, especially mothers, one form of nurse motivator to mothers is to evaluate and direct the importance of maternal role identity in stunting toddlers to cognitive development, so that it is expected to minimize the incidence of stunting. Maternal role identity it is very necessary in supervising the cognitive development of children to minimize the level of delay in cognitive development. Where the period of growth and development at this age can affect behavior at the next stage of development in the future. Therefore, the researcher wanted to know the effect of maternal role in the stimulation of puzzle therapy and identification of animal sounds on the cognitive development of stunted children under five in the Kenjeran Health Center area of Surabaya.

## Method

This study uses a quasi-experimental research design. The respondents of this study consisted of 28 stunting children in the Kenjeran Public Health Center Surabaya which were divided into two groups, namely in the intervention group as many as 14 respondents and the control group as many as 14 respondents and for sampling using simple random sampling technique. The instruments used in this study were the Denver Developmental Screening Test for the language sector and standard operating procedures for puzzle therapy and animal sound identification. After the data is collected, it will be analyzed using the Wilcoxon and Mann Whitney tests.

## Result

Cognitive development of stunting children under five in the intervention group before and after given puzzle therapy and identification of animal sounds in the Kenjeran Public Health Center Surabaya

Intervention Group				
Criteria	<i>Pre-test</i>		<i>Post-test</i>	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Normal	-	-	11	78.6

<i>suspect</i>	7	50.0	3	21.4
<i>Untestable</i>	7	50.0	-	-
Total	14	100.0	14	100.0
Wilcoxon test p = 0.001				

The Wilcoxon test got a significant value of  $p = 0.001$  so it can be concluded that the maternal role in puzzle therapy stimulation and animal sound identification has an effect on the cognitive development of stunted children under five in the Kenjeran Health Center Surabaya.

Cognitive development of stunting children under five in the control group before and after in the Kenjeran Public Health Center Surabaya

Control Group				
Criteria	<i>Pre-test</i>		<i>Post-test</i>	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Normal	-	-	1	7.1
<i>suspect</i>	7	50.0	10	71.4
<i>Untestable</i>	7	50.0	3	21.4
Total	14	100.0	14	100.0
Wilcoxon test p = 0,059				

The Wilcoxon test got a significant value of  $p = 0.059$  so it can be concluded that without puzzle therapy and animal sound identification there is no effect on the cognitive development of stunted children under five in the Kenjeran Health Center Surabaya.

Differences in the effect of puzzle therapy and identification of animal sounds on the cognitive development of stunting children aged under five during the post-test in the intervention group and the control group in the Kenjeran Health Center Surabaya

Criteria	Intervention group		control group	
	<i>Post-test</i>		<i>Post-test</i>	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Normal	11	78.6	1	7.1
<i>suspect</i>	3	21.4	10	71.4
<i>Untestable</i>	-	-	3	21.4
Total	14	100.0	14	100.0
Mann Whitney test p = 0.000				

The Mann Whitney test got a significant value of  $p = 0.000$  so it can be concluded that there are differences in the intervention group and the control group after being given puzzle therapy and identification of animal sounds on the cognitive development of stunted children aged under five in the Kenjeran Health Center Surabaya.

## Discussion

Cognitive development of stunting children under five in the intervention group before and after puzzle therapy and identification of animal sounds in the Kenjeran Public Health Center Surabaya. This shows that there is an influence of maternal role in the stimulation of puzzle therapy and identification of animal sounds on the cognitive development of stunted children under five in the Kenjeran Health Center area of Surabaya. The researcher's assumption is that changes in cognitive development in this group are due to children being given puzzle therapy and identification of animal sounds on a regular basis, twice a week for 30 minutes within one month. Most of the respondents had entered early childhood education, so the researchers assumed this would also affect the cognitive development of stunted children. The language and cognitive development of children who attend early childhood education programs is better than children who do not attend early childhood education programs (Khoiriah et al., 2019). Stunting conditions can have a long-term negative impact on children, namely the risk of delays in growth and development. This risk can be minimized by providing stimulation to children on a regular basis which can be given through educational games (Muloke et al., 2017).

Researchers provided puzzle therapy stimulation and animal sound identification twice a week for 30 minutes for 1 month. The benefits that children get from playing puzzles are for problem-solving skills, train patience, eye agility, and hands. (Oktaviyani and Suri, 2019). Animal sound identification therapy includes sound therapy by giving various kinds of animal sounds and asking the child to guess the animal's sound correctly. The results of the study courtesy of Bruscia et al. (2002); Jackson (2003); Kim (2004); Voight (2003); and Janzen (2018, in (Shahid, 2021) showed that this therapy is useful for reducing hyperactivity and stereotyped behavior, as well as improving focus, attention, and verbal and non-verbal communication skills. So this therapy is suitable for stunting children to improve their cognitive development.

Cognitive development of stunting children under five in the Kenjeran Public Health Center Surabaya in the control group before and after. This shows that without puzzle therapy stimulation and identification of animal sounds, there is no effect on the cognitive development of stunted children under five in the control group in the Kenjeran Health Center area of Surabaya. Respondents' parents stated that they never gave educational games to their children and they tended to allow their children to develop as they were. The majority of respondents have suspect cognitive development. Although many respondents have attended early childhood education, their parents' homes do not stimulate their cognitive development. Cognitive development of late toddlers can be pursued by providing various stimulations at home and incorporating children into early childhood education (Rao et al., 2020). Meanwhile, 1 child from the control group experienced an increase in cognitive development from suspect to normal. This is because the respondents have attended early childhood education. Children who attend early childhood education certainly get motivated to think and express answers to a conflict they face (Egeten et al., 2017). So that researchers assume that early childhood education can affect children's cognitive development.

Differences in the effect of puzzle therapy and identification of animal sounds on the cognitive development of stunted children under five during the post-test in the intervention group and control group in the Kenjeran Health Center Surabaya. This shows that there are differences in the cognitive development of stunted children under five in the intervention group and the control group. This can happen because the intervention group was given regular therapy compared to the control group which was left as is. About 10% of children worldwide have a generalized developmental delay (Suwarba, Widodo, and Handrayastuti, 2008 in Umiyah et al., 2019). Educational game tools have a function to optimize children's development, both physically, language, and socially (Soetjningsih, 2012 in Muloke et al., 2017). Therefore, in addition to paying attention to the intake of nutrients that are important for children's intelligence, the need for stimulation of children's cognitive development must still be met so that children's intelligence can develop optimally and get achievements in school as well as creativity and work productivity in the future.

### **Conclusion**

- There is an influence of maternal role in the stimulation of puzzle therapy and identification of animal sounds on the cognitive development of stunted children under five in the Kenjeran Health Center Surabaya as evidenced by an increase in the cognitive development of the control group respondents.
- Without intervention stimulation, there was no effect on the cognitive development of stunted children under five as evidenced by the cognitive development of stunted children in the control group which did not experience a significant increase in results.
- There are differences in the cognitive development of stunted children under five in the intervention group and the control group.

### **Advice**

It is hoped that the results of this study can be a source of information for mothers with stunting children related to the stimulation of educational games that can stimulate the cognitive development of stunted children under five. It is hoped that the results of this study can be used as basic data and comparisons for further research. It is hoped that health workers can provide health education to parents about the importance of educational games to stimulate the cognitive development of stunted children under five.

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