

## Research Article

# The Effect of the Puzzle Playing Method on Improving the Cognitive Development of Children Aged 4-6 Years

**Asep Mulyana\* and Nida Nurcahyani**

Nursing Undergraduate Study Program, Nursing Faculty of Bhakti Kencana University Tasikmalaya, West Java, Indonesia

### ORCID

Asep Mulyana: <https://orcid.org/0000-0003-4676-9504>

**Abstract.** Playing in early childhood is very important; playing facilitates the learning process. Puzzles are an example of an educational learning method. The aim of this study was to determine the effect of a puzzle playing method on improving the cognitive development of children aged 4-6 years in TK Nurul Iman, Sukakarsa Urban Village, Sukarama Subdistrict, Tasikmalaya District. A quantitative pre-experimental pretest-posttest design was used and data were collected through questionnaires. Respondents in this study included 40 students of TK Nurul Iman in Sukakarsa Urban Village. Data analysis involved the Mann-Whitney U-Test. The results of the pretest showed that 32 participants (80%) were in the low category, and the posttest results showed that 26 children (65%) were in the good category; this difference was significant ( $p < 0.01$ ). This showed that there was an effect of the puzzle playing method on improving the cognitive development of the children aged 4-6 years in TK Nurul Iman, Sukakarsa Urban Village, Sukarama Subdistrict, Tasikmalaya District. This research is expected to be used as a reference for other teachers in helping develop children's cognitive abilities.

**Keywords:** puzzle playing method, improving cognitive development

## 1. Introduction

Education is one of the main pillars in developing the quality of human resources, education is also a change in one's behavior and attitudes in the process so that they can mature themselves through teaching and learning [1]. In the learning process, participants actively interact in developing their abilities such as forms of belief, noble personality, intelligent in thinking and skilled for themselves and everyone, one of which is cognitive understanding.

Cognitive ability is one part of a person's brain development, how children can memorize things and can develop perceptual abilities, memory, ways of thinking, and problem solving. The cognitive abilities that they see can be shown by carrying out their playing activities using game tools that contain educational elements or values to train the brain in memorizing and solving problems [2].

Corresponding Author: Asep Mulyana; email: [asep.mulyana@bku.ac.id](mailto:asep.mulyana@bku.ac.id)

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One of these educational games is using a puzzle game that composes an image or object that has been solved in several parts. Puzzle is a game that composes an image that has not been fully arranged into a perfect form of pieces [3]. By playing puzzle, children can train their intelligence and can solve problems.

TK Nurul Iman is located in Sindangsari Village, Sukakarsa Urban Village, Sukarama Subdistrict, Tasikmalaya District. It has 40 students, there are 3 classes, namely Class A, B and C with ages ranging from 4 to 6 years old. Learning in this TK often involves learning to memorize prayers, memorize children's songs, count and read. Types of games such as swing games, dancing and singing games, discussion games, drama and music games. The students of TK Nurul Iman have not tried learning puzzles of letters, numbers, and objects.

During the current pandemic, the school learning process becomes a rolling system for only 3 days with the number of students divided by two. Learning at TK Nurul Iman is also the same as a rolling system for only 3 days, thereby reducing learning time at school and making children less interactive with teachers or with their peers and learning becomes a little monotonous because learning hours are reduced by shifting.

Based on the results of a preliminary study in the form of interviews with the principal and 10 children about puzzle games, it was found that puzzle games in TK Nurul Iman had never been tried and children did not know how to play puzzle. Based on this phenomenon, researchers are interested in conducting research with the title "The Effect of Puzzle Playing Methods on Improving the Cognitive Development of Early Childhood Aged 4-6 Years Old in TK Nurul Iman".

## 2. Method

The method used in this research is quantitative research with a quasi-experimental design quantitative approach with a pre-experimental pretest-posttest research design. The design of this study was used to compare the results of the puzzle method game intervention.

The independent variable in this study is the effect of the puzzle playing method, while the dependent variable is cognitive development. The population in this study were 40 students of TK Nurul Iman. The sample in this study used total sampling.

The research instrument used a questionnaire and educational tools in the form of a puzzle. Meanwhile, in this study, the validity and reliability tests on the questionnaire were standardized and had been carried out by previous researchers. The questionnaire used has obtained permission from the previous researcher.

TABLE 1: Distribution of Characteristics of Early Childhood Aged 4-6 Years in TK Nurul Iman, Sukakarsa Urban Village, Sukarame Subdistrict, Tasikmalaya District

		Frequency	Percent
Gender	Male	25	62,5%
	Female	15	37,5%
	<b>Amount</b>	<b>40</b>	<b>100%</b>
Age	4 years	10	25%
	5 years	14	35%
	6 years	16	40%
	<b>Amount</b>	<b>40</b>	<b>100%</b>

TABLE 2: Overview of Pretest and Posttest Cognitive Improvement by the Puzzle Playing Method

Behavior	Before		After	
	P	%	p	%
Less	32	80%	0	0
Sufficient	8	20%	1	2,5%
Good	0	0	26	65%
Very Good	0	0	13	32,5%
<b>Total</b>	<b>40</b>	<b>100%</b>	<b>40</b>	<b>100%</b>

### 3. Research Results

The research on the effect of the puzzle playing method on improving cognitive development of children aged 4-6 years was carried out at TK Nurul Iman in Sukakarsa Village on 40 children.

Based on the table above, it is known that the male gender category is 25 people (62,5%) and the female gender is 15 people (37,5%). Meanwhile, the highest age category was at the age of 6 years as many as 16 people (40%), age 5 years as many as 14 people (35%) and age 4 years as many as 10 people (25%).

Based on the results of improving children's cognitive development before the puzzle playing method was carried out with the less value as many as 32 people (80%), and sufficient as many as 8 people (20%). Then, after being given the puzzle playing method, the analysis results obtained were sufficient category as many as 1 person (2,5%), good category as many as 26 people (65%) and very good category as many as 13 people (32,5%).

Based on the pretest-posttest design method with statistical results using the Mann-Whitney U-Test formula, the p value: 0,00 is smaller than the value of  $\alpha$  : 0,05 ( $p < 0,05$ ) which indicates that  $H_0$  is rejected and  $H_a$  is accepted, which means that there is an influence between the puzzle playing method on the cognitive improvement of

TABLE 3: The Effect of the Puzzle Playing Method on Improving the Cognitive Development of Early Childhood Aged 4-6 Years Old in TK Nurul Iman, Sukakarsa Urban Village, Sukarame Subdistrict, Tasikmalaya District

Category	Puzzle Playing Method		p-Value
	Pretest	Posttest	
Very Good	0	13 32,5%	0,00
Good	0	26 65%	
Sufficient	8 20%	1 2,5%	
Less	32 80%	0	
<b>Total</b>	<b>40 100%</b>	<b>40 100%</b>	<b>0,00</b>

early childhood aged 4-6 years in TK Nurul Iman, Sukakarsa Urban Village, Sukarame Subdistrict, Tasikmalaya District.

## 4. Discussion

### 4.1. Puzzle Playing Method

The results of research that have been carried out by researchers state that playing puzzle for children has many changes, it can be seen from children's learning before and after using puzzle tools. Before using puzzle tools, children can see from their understanding of letters, numbers, alphabets and colors, then combine them using puzzle tools. Based on the results of research conducted by Amala (2015) that there are differences in cognitive development before and after being given a puzzle on the cognitive development of children in kindergarten. If the child is given an educational puzzle game, it can help optimize the child's development and train from the child's memory [4]. This is in line with the research of Syukron Mubarak (2019) that there is an improvement in cognitive ability in sorting numbers 1 to 20 after the number puzzle playing method is used. [5].

Playing puzzles also has many benefits such as children being able to train and help their cognitive skills, can improve fine motor skills, can improve social skills, stimulate creativity development, and can improve moral development[6]. Based on the benefits of playing, children will grow and develop optimally. Besides cognitive development, there are 4 developmental aspects that will be stimulated by playing, those are: physical motor aspects, social aspects, emotional aspects, and language aspects. Through play, children learn how to solve problems, improve memory, and focus on an activity.

## 4.2. Improvement of Cognitive Development of Early Childhood Aged 4-6 Years Old

Based on the results of the research that has been carried out, it is found that the results of increasing children's cognitive development before the puzzle playing method is carried out with less value as many as 32 people (80%) and sufficient as many as 8 people (20%), then after being given the puzzle playing method, the sufficient category as many as one person (2,5%), good category as many as 26 people (65%) and very good as many as 13 people (32,5). Observing these results, it can be stated that most of the respondents who have been given puzzle playing tools have good results and develop. This is in accordance with Maghfuroh's research (2018) which shows that the maturation process of the structure and function of the body is characterized by an increase in a person's more complex abilities (Skills) in a regular pattern as a result of the maturity process [7].

Novitasari's research (2018) suggests that 39% of children aged 4-6 years have a lot of problems with cognitive development, then 37% of children are on a lot of criteria, and there are only 17% of children who have very few problems with cognitive development, while 7% of another children do not have problems in cognitive development. Thus, at the age of 0-6 years, children in the golden age must get greater attention for their growth and cognitive development [8].

Cognitive is a thought process in the individual's ability to relate, assess and consider an event which means a broad concept, refers to mental activities in the acquisition, and use of knowledge. [9]. This early childhood cognitive ability is part of an understanding of knowledge that must be developed. This cognitive ability is a very broad understanding of thinking, observing, assessing, remembering and reasoning which results in a child gaining knowledge of problem solving that will be used to interact well with others [10].

## 4.3. The Effect of Puzzle Playing Method on Cognitive Improvement

Based on the pretest-posttest design method with statistical results using the Mann-Whitney U-Test formula, it was found that the p value = 0,00 which indicates that there is an effect of playing puzzles on children's cognitive improvement. The Effect of the puzzle playing method on improving cognitive development really expects that children can develop in their knowledge by using the puzzle playing method. So in this study,

what is meant by effect is something in the form of strength that can affect children's cognitive improvement.

Based on the results of research from Wulandari (2018), it is stated that there is effect of puzzle games on children's cognitive development. This can be seen from the results of the experimental class Preetest and Posttest increased by 12,25% from the previous results [11]. This is in line with the results of Rizkia's research (2019) which was conducted on 30 students at TK/TPQ Plus Hidayatullah, with the title The Effect of Puzzle Playing Therapy on Cognitive Development of Pre-school Age Children with the value of Sig. 0,025 with a standard p value <0,05 which means that there is an effect between puzzle playing therapy on the cognitive development of pre-school age children [12].

## 5. Conclusion

1. The puzzle game method can be used to improve children's cognitive level, the results show that the most 26 people (65%) were in the good category at the time of the post-test.
2. Cognitive level of early childhood aged 4-6 years in TK Nurul Iman, Sukakarsa Urban Village, Sukarame Subdistrict, Tasikmalaya District, most of them are in the less category as many as 32 people (80%).
3. There is an effect between the puzzle playing method on improving cognitive development of early childhood aged 4-6 years in TK Nurul Iman, Sukakarsa Urban Village, Sukarame Subdistrict, Tasikmalaya District.

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