

The Relationship between Parental Knowledge, Parenting Style, and Nutritional Status with Cognitive Development in Children Aged 4–6 Years

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ABSTRACT

Introduction: Early childhood is a critical period for cognitive growth, where development is strongly influenced by environmental and parental factors. Parents' knowledge, parenting patterns, and nutritional status play a major role in shaping children's cognitive abilities during this stage.

Objective: Child growth and development encompass two aspects: growth and development. This growth is seen through increases in size and weight, such as height and weight gain. Development is defined as a progressive series of regular changes, focusing more on psychological and intellectual development. Children's cognitive development is part of the growth and development process. The purpose of this study is to determine the relationship between the level of knowledge, parenting patterns, and nutritional status with cognitive development in early childhood aged 4-6 years at Cahaya Mulia PAUD, Pebuar Village, West Bangka Regency in 2025.

Method: This research method was carried out using Cross Sectional and Chi Square test with the results in the form of univariate analysis and bivariate analysis. The population in this study were students at PAUD Cahaya Mulia, Pebuar village, Jebus district in 2024. The sample of this study was all students totaling 30 respondents.

Result: The results of the study showed that there was a relationship between knowledge ($p = 0.002$), parenting patterns ($p = 0.029$) and nutritional status ($p = 0.018$) with the cognitive development of children at PAUD Cahaya Mulia, Pebuar village, Jebus district in 2025

Conclusion: The conclusion is that cognitive development is influenced by various factors including knowledge, parenting patterns, and nutritional status. Each factor has a significant relationship.

Keywords: cognitive, knowledge, nutritional status, parenting patterns

Introduction

Child development encompasses two aspects: growth and development. Growth refers to quantitative changes visible in a child's physique, organs, and body structure. This growth is evident in increases in size and weight, such as height and weight. Development is defined as a progressive series of orderly changes, focusing more on psychological and intellectual development (Rantina, et.al. 2021). Early childhood growth and development are influenced by both internal and external factors. Internal factors include age, genetics, chromosomes, race, and gender. External factors include parental knowledge, parenting styles, economic, social, and nutritional status. During a child's golden period, parents must be more observant and careful in monitoring their child's growth and development, as it significantly impacts their future development. With proper supervision, optimal child growth and development can be achieved, and developmental disorders can be prevented early (Dhiu, et.al. 2021).

Globally, low- and lower-middle-income countries are home to over 60% of the world's preschool-age children, but only 32% of all preschool teachers. There are 422,000 preschool teachers currently teaching in low-income countries. With a growing population, assuming an ideal student-teacher ratio of 20 to 1, the world will need 9.3 million new preschool teachers to meet the 2030 preschool education target (UNICEF, 2020).

The number of early childhood children in Indonesia is estimated at 30.2 million in 2023. This represents a 1.7% decrease compared to the previous year's figure of 30.73 million. This continues a trend that has been observed since 2020. There are more boys than girls in early childhood in Indonesia. This is reflected in the early childhood sex ratio of 104.16 in 2023, meaning there are 104 boys for every 100 girls. 59.95% of early childhood children in Indonesia are between the ages of 1 and 4. A total of 28.83% of early childhood children are in the 5-6 age group. Meanwhile, 11.22% of early childhood children are less than one year old (Central Statistics Agency of Indonesia, 2023).

The gross enrollment rate (GER) of children attending early childhood education (PAUD) in Indonesia was 35.59% in 2021, 35.28% in 2022, 36.36% in 2023, and 36.03% in 2024. The gross enrollment rate (GER) of children attending early childhood education (PAUD) in Bangka Belitung province was 31.73% in 2021, 32.12% in 2022, 32.55% in 2023, and 31.75% in 2024 (Central Statistics Agency of Indonesia, 2024).

Cognitive development refers to the stages in a child's ability to acquire knowledge and meaning from the experiences and information they receive. The development of these skills is essential for children to process information, evaluate, analyze, remember, compare, and understand the cause-and-effect relationships within an event (Dhiu, 2021). Cognitive development varies from child to child and is often linked to genetic factors, although much of it can be learned. Thinking and learning abilities can be enhanced through practice or appropriate stimulation. The stages of cognitive development also vary with age (Rozana, et al., 2020). During a child's growth and development, cognitive development can be influenced by several factors, including breast milk intake, nutritional status, parenting styles, heredity, the surrounding environment, and parental knowledge.

Parental knowledge about children's cognitive development can influence the child's own cognitive development. Parental knowledge guides parents to interact productively with their children according to their developmental stage. Parenting styles influence children's cognitive skills. Parents teach their children how to think critically,

solve problems, and develop self-control. Nutritional status is related to a child's nutritional intake. The influence of nutrition on a baby's brain begins even before birth, specifically with the nutrition the mother consumes during pregnancy. Good nutrition has a positive effect on a child's development.

This research is in line with the research conducted by Katimenta et.al. (2023) on the relationship of parenting patterns to the cognitive development of early childhood in PAUD Pandeheh Palangkaraya, Ha was accepted stating that there is a significant relationship about the Relationship of Parenting Patterns to the Cognitive Development of Early Childhood in PAUD Pandeheh Palangka Raya, $p \text{ value} = .000 < \alpha (0.05)$ that is $p \text{ value} < 0.05$ then there is a significant relationship and it is proven that the strength of the correlation $p \text{ count} .000$ is very weak but the direction of the correlation is positive with the result of $.663^{**}$ at the 0.01 level which states that the correlation is in the same direction. so it can be concluded that there is a significant relationship between parenting patterns to the cognitive development of early childhood in PAUD Pandeheh Palangka Raya which is closely significant. This research aligns with research conducted by Pitriani et al. (2021) on the relationship between nutritional status and cognitive development in children aged 5-6 years. The results showed a significant relationship between body mass index and cognitive development, smaller than the alpha value, or $0.009 < 0.05$. The relationship between mid-upper arm circumference and child development, with a significant value smaller than the alpha value, or $0.024 < 0.05$, rejected H_0 , with correlations of -0.512 and -0.449 . Therefore, it can be concluded that there is a very weak relationship between nutritional status and cognitive development in children aged 5-6 years at RA Hidayatul Insan Palangka Raya.

Based on a survey conducted by researchers on December 2, 2024, at Cahaya Mulia Early Childhood Education (PAUD Cahaya Mulia), data showed that 5 out of 7 students could say their own names, recognize their friends' names, recognize their teachers' names, and write. This raises questions for researchers about the factors that cause the cognitive diversity demonstrated by students at this PAUD. Researchers suspect that parental knowledge, parenting styles, and nutritional status are the influencing factors. Therefore, they want to test this hypothesis by examining the relationship between knowledge levels, parenting styles, and nutritional status and cognitive development in children aged 4-6 years at Cahaya Mulia Early Childhood Education Center (PAUD) in Pebuar Village, West Bangka Regency, in 2025.

Objective

The relationship between knowledge level, parenting patterns, and nutritional status with cognitive development in early childhood aged 4-6 years at Cahaya Mulia PAUD, Pebuar Village, West Bangka Regency in 2025 was known.

Method

This research employed a cross-sectional design with Chi-Square testing, producing both univariate and bivariate analyses. The population in this study consisted of students at PAUD Cahaya Mulia, Pebuar Village, Jebus District in 2024, with a total sample of 30 respondents. Data were collected through questionnaires distributed to the students' parents and then analyzed statistically using computer-based software. The parenting knowledge questionnaire contained 10 items with two answer options: "correct," scored 1, and "incorrect," scored 0. Knowledge levels were categorized as

“good” (coded 1) and “poor” (coded 2). The parenting questionnaire included 15 items with four response options: “always” (4 points), “often” (3 points), “rarely” (2 points), and “never” (1 point), with the parenting variable categorized as “good” (coded 1) or “poor” (coded 2). Nutritional status was measured through direct observation of weight and height to calculate the Body Mass Index (BMI) based on the Ministry of Health guidelines (P2PT Ministry of Health, 2018). The results were categorized as “good” (coded 1) or “poor” (coded 2). The child cognitive development instrument consisted of 10 items with three answer options: “complete” (scored 3), “partial” (scored 2), and “unable” (scored 1), and the results were grouped into “good” (coded 1) and “poor” (coded 2). Data analysis was performed using the Chi-Square test to determine the relationship between variables divided into several categories. The calculation was conducted using statistical software with a significance level of $\alpha = 0.05$. A p-value less than α ($p < 0.05$) indicates a significant relationship between the analyzed variables.

Result

Table 1. The Relationship between Parental Knowledge and Children's Cognitive Development

Knowledge	Cognitive		Total	p value	odd ratio
	Good	Poor			
Good	21 95.5%	1 4.5%	22 100.0%	0.002	35.000
Poor	3 37.5%	5 62.5%	8 100.0%		
Total	24 80.0%	6 20.0%	30 100.0%		

Table above shows that 21 respondents (95.5%) had good cognitive development with good knowledge, outnumbering those with poor knowledge. Meanwhile, 5 respondents (62.3%) had poor cognitive development with poor knowledge, outnumbering those with poor knowledge. The statistical test results obtained a p value of $0.002 < 0.005$, which means H_0 is rejected, so there is a significant relationship between parental knowledge and children's cognitive development at Cahaya Mulia PAUD, Pebuar Village, West Bangka Regency. The statistical test results also show an odds ratio value of 35,000, which means that children with good parental knowledge have a 35,000 times greater chance of having good cognitive development compared to children with poor parental knowledge.

Table 2. The Relationship between Parenting Styles and Children's Cognitive Development

Parenting Style	Cognitive		Total	p value	odd ratio
	Good	Poor			
Good	20 90.9%	2 9.1%	22 100.0%	0.029	10.000
Poor	4 50.0%	4 50.0%	8 100.0%		
Total	24 80.0%	6 20.0%	30 100.0%		

Table above shows that 20 respondents (90.9%) had good cognitive development with good parenting styles, more than those with poor parenting styles. Meanwhile, 4 respondents (50.0%) had poor cognitive development with poor parenting styles, the same as those with poor parenting styles. Based on table 8, it is known that the majority of children have good cognitive development with good parenting patterns, namely 20 respondents (90.9%). The results of the statistical test obtained a p value of 0.029 < 0.005, which means H₀ is rejected, so there is a significant relationship between parenting patterns and children's cognitive development at Cahaya Mulia PAUD, Pebuar Village, West Bangka Regency. The results of the statistical test also show an odds ratio value of 10,000, which means that children with good parenting patterns have a 10,000 times greater chance of having good cognitive development compared to children with poor parenting patterns.

Table 3. The Relationship Between Child Nutritional Status and Cognitive Development

Nutritional Status	Cognitive		Total	p value	Odd Ratio
	Good	Poor			
Good	23 88.5%	3 11.5%	26 100.0%	0,018	23.000
Poor	1 25.0%	3 75.0%	4 100.0%		
Total	24 80.0%	6 20.0%	30 100.0%		

Table above shows that 23 respondents (85.5%) had good cognitive development with good nutritional status, outnumbering those with poor nutritional status. Meanwhile, 3 respondents (75.0%) had poor cognitive development with poor nutritional status, outnumbering those with poor nutritional status. The statistical test results obtained a p value of 0.018 < 0.005, which means H₀ is rejected, so there is a significant relationship between children's nutritional status and cognitive development of children at Cahaya Mulia PAUD, Pebuar Village, West Bangka Regency. The statistical test results also show an odds ratio value of 23,000, which means that children with good nutritional status have a 23,000 times greater chance of having good cognitive development compared to children with poor nutritional status.

Discussion

Cognitive skills can best be taught by parents, both as role models and through parent-child interactions. Parents teach their children how to think critically, solve problems, and develop self-control. From a natural cognitive development perspective, parents play the most important role in how children think. Cognitive development is a mental ability that encompasses thinking, learning, and remembering (Rantina et al. 2021). Some things parents can do to support their children's cognitive development include (1) providing affection and attention, (2) teaching social skills, (3) providing opportunities for play and exploration, (4) establishing healthy daily routines, (5) being a good role model, and (6) providing a safe and comfortable environment.

Based on statistical test results, it was found that the majority of children with good parenting patterns, 20 respondents (90.9%), had good cognitive development. The statistical test results obtained a p value of $0.029 < 0.005$, indicating that H_0 was rejected. This suggests a significant relationship between parenting styles and children's cognitive development at Cahaya Mulia Early Childhood Education Center (PAUD) in Pebuar Village, West Bangka Regency. The statistical test results also showed an odds ratio of 10,000, indicating that children with good parenting styles are 10,000 times more likely to have good cognitive development than children with poor parenting styles.

Based on the above research findings, the researcher assumes that parents educate their children on critical thinking, problem-solving, and self-control. From a natural cognitive development perspective, parents play a crucial role in how children think. Parents can improve their children's cognitive abilities by playing with their children, providing learning resources such as stationery and books, teaching children to read, playing or listening to music together, creating arts and crafts with their children, and engaging in other interactions with their children that foster closeness between parents and children.

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Based on the research results above, the researcher assumes that parents educate their children about how to think critically, solve problems, and self-control. From the perspective of natural cognitive development, parents play the most important role in how children think. Ways that parents can improve children's cognitive abilities are: by

playing with children, providing children with learning tools and infrastructure such as stationery and books, teaching children to read, playing or listening to music together, making art and crafts with children, and other interactions with children that build closeness between parents and children.

Researchers believe it's important to maintain or even achieve an ideal, healthy weight. Maintaining a healthy weight can help prevent and manage many diseases and conditions. Being overweight or obese puts you at a higher risk of serious health problems, such as heart disease, high blood pressure, type 2 diabetes, gallstones, respiratory problems, and certain types of cancer. Furthermore, maintaining a healthy weight can lead to greater self-confidence and more energy to enjoy life.

Conclusion

There is a significant relationship between parental knowledge, parenting patterns, and children's nutritional status with children's cognitive development at Cahaya Mulia PAUD, Pebuar Village, West Bangka Regency.

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