



**THE RELATIONSHIP BETWEEN MATERNAL KNOWLEDGE OF THE "ISI PIRINGKU" PROGRAM AND THE NUTRITIONAL STATUS AND DEVELOPMENT OF TODDLERS AT THE POSYANDU**

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**ABSTRACT**

Toddlers are in the "Golden Age Period," where their growth and development are highly influenced by nutritional intake. Mothers play a key role in planning daily meals that meet the nutritional needs of their children, with the government's "Isi Piringku" program serving as a guideline for meal planning. This study aims to analyze the relationship between mothers' knowledge of the Isi Piringku program and the nutritional status and development of toddlers at Posyandu in Sumbang Village. Methods: This cross-sectional study employed an analytical observational approach. The sample size was calculated using the Slovin formula, with cluster random sampling as the sampling technique. The Gamma correlation test was used to analyze the relationship between variables. The study found a significant relationship between mothers' knowledge of Isi Piringku and toddlers' nutritional status (p-value = 0.000; r = 0.818). Additionally, there was a strong correlation between mothers' knowledge and toddler development (p-value = 0.000; r = 0.717). Mothers' knowledge of the Isi Piringku program is significantly related to the nutritional status and development of toddlers at Posyandu in Sumbang Village.

Keywords: development of toddlers; isi piringku; mother's knowledge; nutritional status

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**INTRODUCTION**

Based on WHO statistics from 2020, 149 million or 22% of children under five worldwide were stunted, including 6.3 million in Indonesia (WHO, 2020). In 2021, 22.3% (148.1 million) of children were stunted, 6.8% (45 million) experienced wasting, and 5.6% (37 million) were overweight. UNICEF and WHO reports from 2023 indicate that in 2022, 148.1 million children under five experienced stunting, and at least 45 million suffered from wasting at some point during the year. The number of overweight children under five also increased, from 33 million in 2000 to 37 million in 2022 (WHO, 2023). According to data from the Ministry of Health, the prevalence of stunting in Indonesia reached 21.6% in 2022. Meanwhile, data from the Health Office of Banyumas Regency in 2022 recorded 5,364 cases of undernutrition and 180 cases of severe malnutrition. Sumbang District emerged as one of the regions with the highest cases, reporting 380 cases of undernutrition and 16 cases of severe malnutrition. The high prevalence of stunting, wasting, and dual nutritional issues, such as undernutrition and overnutrition, has serious consequences for millions of children and adolescents in Indonesia. The growth and development of toddlers are crucial for the future success of creating high-quality human resources (Yuliarsih dkk., 2020).

Toddlers refer to children aged 0 to 59 months. During this age, achieving optimal weight and height requires a balanced nutritional intake in both quantity and quality (Ministry of Health RI, 2014). This period, often referred to as the golden age period, is vital for future optimal development, heavily influenced by this phase. It is a critical period in a child's life that

demands significant attention. Rapid growth in physical aspects such as height and weight, as well as psychomotor, mental, and social development, occurs during this time (Devriany & Wulandari, 2021). Nutrition is one of the most influential factors in supporting a child's development. A lack of nutrition can hinder a child's growth. The daily diet plays a crucial role in fostering optimal development, with adequate nutrient intake being a key determinant (Susanti dkk., 2014).

Maternal behaviour in selecting inappropriate food can lead to nutritional deficiencies in toddlers. This inaccuracy is influenced by mothers' knowledge regarding the nutritional needs of toddlers. Nutritional intake in toddlers is considered adequate when it meets their daily requirements. Nutritional deficiencies can result in negative effects, such as disrupted brain development, which may impair intelligence (Sunartyo, 2017). Mothers, as the family members closest to the child, play a crucial role in maintaining nutritional balance by planning daily menus. With sufficient knowledge, mothers can ensure proper nutrition for their families (Puspasari & Andriani, 2017). One common reason toddlers experience eating problems is the lack of maternal knowledge about proper feeding practices. Prolonged eating difficulties can lead to developmental failure (A. F. Putri, 2018). A mother's nutritional knowledge significantly impacts the nutritional status of toddlers. Good knowledge is reflected in appropriate feeding practices for toddlers (Rahmawati & Retnaningrum, 2022).

Previous studies indicate a positive correlation between children's nutritional status and their development between the ages of 1–5 years (Gannika, 2023). Children with good nutritional status tend to grow and develop according to their age. Parental knowledge, particularly mothers' understanding of child development, also influences developmental levels (Syahailatua & Kartini, 2020). A lack of parental knowledge and awareness, especially among mothers, about child development can lead to physical and mental developmental disorders (Harahap dkk., 2018). To address these challenges, the government introduced the "Isi Piringku" educational programme, which aims to guide food composition with recommended portions. This programme, initiated by the Indonesian Ministry of Health in 2017, serves as a balanced nutrition guideline. It not only outlines the types of food but also suggests appropriate portions for each meal. "Isi Piringku" emphasises the importance of variety and balance in meals (Fitriani dkk., 2020). Research by Kasmawati et al., (2022) demonstrates that the Isi Piringku guideline effectively improves the nutritional status of stunted toddlers.

Interviews with five mothers of toddlers aged 2–5 years in Sumbang Village revealed that four out of five mothers did not follow the recommended types and portions of food for a single meal. Children often requested specific foods, such as eggs or noodles, and mothers provided these based on the child's preferences, albeit with some restrictions. Additionally, four out of five mothers admitted to being unaware of the Isi Piringku programme and fed their children based on their requests. Among the five toddlers, two had normal nutritional status, two were undernourished, one was at risk of overnutrition, four exhibited age-appropriate development, and one showed questionable development. Based The aim of this study is to examine the relationship between mothers' level of knowledge about Isi Piringku and the nutritional status and development of toddlers at the Posyandu in Sumbang Village.

## **METHOD**

This study employs a correlational design with an observational analytic approach, aiming to determine the relationship between the independent variable—mothers' knowledge of the Isi Piringku programme—and the dependent variables, namely the nutritional status and development of toddlers. The research adopts a cross-sectional design and was conducted across 10 Posyandu (Integrated Health Posts) in Sumbang Village, Sumbang Subdistrict,

Banyumas Regency. The data collection period spanned from March to April 2024. The sample size was calculated using Slovin's formula, and sample distribution across each Posyandu was determined using proportional allocation. The total sample comprised 76 toddlers aged 2–5 years, selected from the population in Sumbang Village's Posyandu. The sampling method used was cluster random sampling, where randomisation was performed by drawing lots from slips of paper containing respondents' names. The selected respondents were included in the study sample. Inclusion criteria for the study included mothers with toddlers aged 2–5 years who actively attended Posyandu, mothers willing to participate as respondents, mothers capable of reading and writing, and primary caregivers of toddlers, which could include grandmothers or other relatives. Exclusion criteria covered mothers and toddlers who were absent from Posyandu during the research period, toddlers who were currently or recently hospitalised within the past month, and toddlers with congenital abnormalities.

The objective of this research was to examine the relationship between mothers' knowledge of the Isi Piringku programme and the nutritional status and development of toddlers. The Isi Piringku questionnaire in this study was deemed valid for all items, with r-values ranging from 0.451 to 0.652 ( $r\text{-calculated} > r\text{-table} = 0.3610$ ). Additionally, the questionnaire was found to be reliable, with a Cronbach's Alpha score of 0.835. Data analysis was performed using the Gamma correlation test, appropriate for ordinal data and correlational hypotheses, via IBM SPSS 25. Validity testing was conducted using the Pearson Product-Moment correlation. Ethical approval for the study was obtained under the reference number KEPK/UMP/82/II/2024.

## RESULT

### Description of Respondents' Characteristics Based on Age, Education, and Occupation

Table 1.  
Frequency Distribution of Respondent Mothers Based on Age, Education, and Occupation in the Posyandu Areas of Sumbang Village, March–April 2024 (n=76)

Characteristic	f	%
Age (years old)		
Mean±SD	32,75±6,672	
Min-Max	22-48	
Education		
SD	26	34,2
SMP	25	32,9
SMA/SMK	24	31,6
S1	1	1,3
Occupation		
Not Working	70	92,1
Working	6	7,9

Based on the data obtained from table 1, the characteristics of respondent mothers reveal that the average age of the mothers is 33 years. The educational level of the mothers is relatively evenly distributed, with 34.2% having completed primary school, 32.9% having completed junior high school, and 31.6% having completed senior high school or vocational school. Meanwhile, the majority of the respondent mothers are not employed, accounting for 92.1% of the sample.

Characteristics of Toddlers Based on Age, Gender, Birth Order, Weight, and Height  
Table 2.

Frequency Distribution of Toddler Respondents Based on Age, Gender, Birth Order, Weight, and Height in Posyandu, Sumbang Village, March-April 2024 (n=76)

Characteristic	f	%
Age (month)		
Mean±SD	41,84±10,965	
Min-Max	24-59	
Gender		
Male	38	50
Female	38	50
Birth Order		
First Child	26	34,2
Second Child	36	47,4
Third Child	13	17,1
Fourth Child	1	1,3
Weight		
Mean±SD	14,14±4,537	
Min-Max	8,5-40,3	
Height		
Mean±SD	95,88±9,802	
Min-Max	70-120	

Based on the data from Table 2, the average age of the respondents' toddlers is 42 months, with an equal proportion of males and females (50% each). Grouping based on birth order shows that the majority of the toddlers are second-born children, accounting for 47.4%. The average weight of the toddlers is recorded at 14.14 kg, while the average height is 95.88 cm.

Description of Mothers' Knowledge Level about the Isi Piringku Program at Posyandu in the Sumbang Village Area

Table 3.

Frequency Distribution of Mothers' Knowledge Level about the Isi Piringku Program at Posyandu in the Sumbang Village Area, March-April 2024 (n=76)

Mothers' Knowledge	f	%
Good	26	34,2
Adequate	30	39,5
Poor	20	26,3

Based on the data obtained from Table 3, the most common level of knowledge among mothers about the "Isi Piringku" program is the "adequate" level, with 30 respondents (39.5%). The lowest number was found at the "poor" knowledge level, with 20 respondents (26.3%).

Description of Nutritional Status of Children Aged 2-5 Years in Posyandu of Sumbang Village Area

Table 4.

Frequency Distribution of Nutritional Status of Children Aged 2-5 Years in the Posyandu of Sumbang Village Area, March-April 2024 (n=76)

Nutritional Status	f	%
Good Nutrition	48	63,2
At Risk of Overnutrition	1	1,3
Overnutrition	5	6,6
Obesity	2	2,6
Undernutrition	20	26,3
Malnutrition	0	0

Based on the data from Table 4, the majority of toddlers aged 2-5 years in the Posyandu of Sumbang Village have good nutritional status (63.2%). Meanwhile, only 1.3% of toddlers are at risk of being overweight, and no toddlers were found to have poor nutritional status.

Overview of the Development of Toddlers Aged 2-5 Years in the Posyandu of Sumbang Village

Table 5.  
Distribution of Toddler Development Status Aged 2-5 Years in the Posyandu of Sumbang Village, March-April 2024 (n=76)

Development	f	%
Age-appropriate	42	55,3
Doubtful	30	39,5
Deviation	4	5,3

Based on the data from Table 5, the majority of toddlers aged 2-5 years in the Posyandu of Sumbang Village show age-appropriate development, with 42 toddlers (55.3%). In contrast, only 4 toddlers (5.3%) showed developmental deviations.

Relationship Between Maternal Knowledge of the Isi Piringku Program and Nutritional Status of Toddlers Aged 2-5 Years in the Posyandu of Sumbang Village

Table 6.  
Relationship Between Maternal Knowledge of Isi Piringku and Nutritional Status of Toddlers, March-April 2024 (n=76)

Mothers' Knowledge of the Isi Piringku Program	Status Gizi Balita						Total		p-value	Correlation value
	Good Nutrition	At Risk of Overnutrition	Overnutrition	Obesity	Undernutrition	Malnutrition	F	%		
Good	24	0	0	1	1	0	26	34,2	0,000	0,818
Adequate	21	1	2	1	5	0	30	39,5		
Poor	3	0	3	0	14	0	20	26,3		

Data analysis using the Gamma correlation test showed a p-value of 0.000, indicating  $p < 0.05$ , which suggests a significant relationship between mothers' knowledge of the "Isi Piringku" program and the nutritional status of toddlers. The correlation value of 0.818 indicates that the strength of the relationship between the two variables is very strong.

The Relationship Between Mothers' Knowledge of the "Isi Piringku" Program and the Development of Toddlers Aged 2-5 Years at Posyandu in Sumbang Village

Table 7.  
The Relationship Between Mothers' Knowledge of the "Isi Piringku" Program and Toddler Development, March-April 2024 (n=76)

Mothers' Knowledge of the Isi Piringku Program	Perkembangan Balita			Total		p-value	Nilai Korelasi
	Age-appropriate	Doubtful	Deviation	F	%		
Good	25	0	1	26	55,3	0,000	0,771
Adequate	12	18	0	30	39,5		
Poor	5	12	3	20	5,3		

The results of the Gamma correlation test show a p-value of 0.000, which means  $p < 0.05$ , indicating a significant relationship between mothers' knowledge of the "Isi Piringku" program and toddler development. The obtained correlation value of 0.771 suggests a strong relationship between the two variables.

**DISCUSSION**

**Mother's Characteristics Overview**

The majority of mothers are in the age range of 26 to 35 years, with an average age of approximately 32 years. At this stage, a mother is in early adulthood, a period where women are considered capable of pregnancy and becoming parents. Women in early adulthood typically exhibit optimal physical condition, reflecting maximal growth and development, along with good health and stamina. Therefore, they are viewed as capable of having and raising children whose growth and development align with their age (A. F. Putri, 2018; D. Putri & Yuliasuti, 2022). The educational level of mothers is almost evenly distributed among primary, junior secondary, and senior secondary levels. However, lower education levels are not necessarily correlated with lower knowledge. Thus, education level cannot be considered a definitive indicator of a person's knowledge. Knowledge can be influenced by various factors, as stated by Notoatmodjo (2018), who pointed out that age, education, occupation, experience, and sources of information are some of the factors affecting the level of knowledge (Notoatmodjo, 2018).

The majority of mothers in this study do not work. Non-working mothers are those not directly involved in income-generating activities and thus focus more on household affairs (Rakhmawati & Panunggal, 2014). According to information from posyandu (community health post) cadres, non-working mothers tend to be more actively involved in attending and participating in posyandu activities to monitor their children's growth and development directly, compared to working mothers. Working mothers often leave their children with caregivers such as grandmothers or relatives, which means they cannot monitor or consult directly with health cadres or personnel about their children's development. Non-working mothers generally focus on their roles as homemakers, with their primary responsibilities including household maintenance (Eva dkk., 2021).

**Overview of Toddler Characteristics**

The average age of toddlers in this study is 42 months, placing them in the preschool phase. At this stage, preschool children are the primary focus of nutritional improvement efforts, and their nutritional quality needs to be taken seriously. Nutritional deficiencies at this age can lead to serious problems, such as difficulties in concentrating during learning, stunted physical growth, reduced immunity, and damage to brain structure and function (Mulyadi Mubarak & Robandi, 2024). The number of male and female toddlers in this study is balanced, with each group having 24 toddlers with good nutritional status. However, the

majority of toddlers with poor nutrition are female, while those with excess nutrition are predominantly male. Only one male toddler has a nutritional risk for excess, and both genders experience obesity. Therefore, gender is not always a determining factor for nutritional status, as it is influenced by many aspects, such as food availability within the family, caregiving, healthy environment, healthcare services, family culture, and knowledge and education (Arlius dkk., 2017).

Most toddlers are the second child in the family, indicating that second-born children are more common than first, third, or fourth-born children. With an average maternal age of around 32 years, it can be concluded that many mothers have their second child at this age. Having multiple children can reduce the attention given to each child, and the more family members there are, the more it affects the sufficiency of food consumption and children's nutritional status (R. F. Putri dkk., 2015). The average weight of toddlers in this study is 14.14 kg, and the average height is 95.88 cm. Based on the WHO growth curve, this suggests that most toddlers have a good nutritional status. Nutritional status can be accurately assessed through weight and height measurements, as both parameters provide a clear picture of current nutritional status. Weight gain usually aligns with an increase in height (Susanti dkk., 2014).

### **Mothers' Knowledge of the Isi Piringku Program**

The majority of mothers answered correctly regarding the definition of the "Isi Piringku" program, but most gave incorrect answers when asked about the composition of food for toddlers. This lack of knowledge can lead to inappropriate behaviors, where mothers feed their children without considering nutritional balance, only following the child's requests. A study by Olsa dkk. (2018) showed that improper attitudes in food selection by mothers could lead to nutritional deficiencies in toddlers. A mother's knowledge of nutritional intake plays a critical role in determining a proper diet (Olsa dkk., 2018). Therefore, the "Isi Piringku" guidelines can serve as a reference for mothers in providing better meals for toddlers (Lastariwati dkk., 2019; Olsa dkk., 2018). Other studies have shown that participants rated the material on creating healthy menus for toddlers as very important, with the knowledge of "Isi Piringku" scoring 3.9 and the practice of preparing and serving vegetables, side dishes, and fruits for toddlers scoring 3.82, both categorized as very important (Lastariwati dkk., 2019).

### **Toddler Nutritional Status**

This study shows that the majority of toddlers, 63.2%, have a good nutritional status, indicating that their bodies are receiving sufficient nutrients that can be optimally utilized. Nutritious food is crucial for children's health, intelligence, and growth and development (Ghinanda dkk., 2022). However, 26.3% of toddlers were undernourished, and 6.6% were classified as overweight. Nilakesuma dkk. (2015) state that nutritional status issues in children, such as undernutrition and overweight, stem from improper eating habits, which are one of the causes. Lack of knowledge in food selection and feeding practices contributes to this problem (Husnah, 2015). The study also found that 1.3% of toddlers were at risk of overweight, 6.6% were overweight, and 2.6% were obese. Obesity in toddlers indicates the need for special intervention, as it is not an indicator of health (Kusumaningrum dkk., 2021).

### **Toddler Development**

The majority of toddlers in this study, 55.3%, were at an age-appropriate developmental stage. This finding aligns with research by Kusumaningrum dkk. (2021), where approximately 86.2% of respondents showed appropriate development. This suggests that most parents pay attention to their children's development. However, 39.5% of toddlers showed questionable development, and 5.3% exhibited developmental deviations. Developmental discrepancies can

be influenced by various factors, such as the environment, a lack of parental knowledge and skills, and unmet basic needs of the child (Mayun dkk., 2023; Rakhmawati & Panunggal, 2014). Developmental measurements in the pre-screening developmental questionnaire (KPSP) include gross motor skills, fine motor skills, language abilities, as well as socialization and independence appropriate for the child's age. The findings indicate that many toddlers experience delays in speech and language (Rismawan dkk., 2018). Therefore, a nursing intervention that can be implemented is providing counseling on the KPSP to help mothers detect early signs of developmental deviations. In this way, mothers can determine if their child's development is within normal limits and take corrective action if deviations are found (Inten & Permatasari, 2019; Rismawan dkk., 2018).

### **The Relationship Between Mother's Knowledge of "Isi Piringku" and Toddler Nutritional Status**

This study shows a significant relationship between mothers' knowledge of the "Isi Piringku" program and toddlers' nutritional status, with a p-value of 0.000 and a correlation coefficient of  $r=0.818$ , indicating a very strong relationship. The data shows that 31.5% of mothers have good knowledge, and their children also have good nutritional status. Good knowledge of "Isi Piringku" helps shape positive perceptions and attitudes toward feeding children. Consistency in healthy eating behaviors, based on knowledge, can lead to optimal nutritional status in toddlers. According to research by Rahmanindar & Harnawati (2020), the "Isi Piringku" guidelines are effective in improving toddler nutritional status. The study found that 2.6% of toddlers experienced obesity, and these toddlers were primarily from mothers with good and sufficient knowledge. Childhood obesity is often caused by misconceptions that health is characterized by excess body weight. This perception leads mothers to provide excessive amounts of food so their children appear healthy according to societal views. In some cultures, obesity is seen as a symbol of prosperity, which also contributes to the preference for fast food (Ghinanda dkk., 2022).

The research also recorded that one toddler with malnutrition was from a mother with good knowledge, while five toddlers with malnutrition were from mothers with sufficient knowledge. This suggests that although mothers understand the theory of proper feeding, its application in daily behavior may not be optimal, leading to malnutrition in the children. Additionally, other factors may influence the nutritional status of toddlers. The data also revealed that 14 toddlers with malnutrition were from mothers with limited knowledge. This indicates that a lack of maternal knowledge negatively impacts the nutritional status of children. Knowledge plays a crucial role in supporting health behaviors. Communities with low health knowledge tend to struggle in adopting healthy behaviors. Therefore, the involvement of various parties, including support from the surrounding environment and education from healthcare providers, such as health counseling, is necessary to encourage behavioral changes toward healthier practices (Hafifah & Abidin, 2020).

### **Relationship between Maternal Knowledge of the "Isi Piringku" Program and Child Development**

The study found a significant relationship between maternal knowledge of the "Isi Piringku" program and child development, with a p-value of 0.000 and an r-value of 0.717, indicating a strong relationship. The better the maternal knowledge, the better the child's development. This was evident in the 25 children who were at the appropriate developmental stage, all of whom had mothers with good knowledge. The family, particularly the mother's role, is a crucial factor in the child's growth and development, with maternal knowledge and attitudes being key elements (Arlus dkk., 2017; Forh dkk., 2022). However, one child with developmental delays was found to have a mother with good knowledge, but the mother was

employed. This suggests that despite the mother's knowledge of the "Isi Piringku" program, she may not have enough time to monitor her child's development directly due to her work commitments or because the child is cared for by a grandmother or relative. Research by Sunartyo (2017) states that a child's growth and development are influenced not only by genetic factors or nutrition but also by parenting styles and the surrounding environment.

The study also found three children with developmental delays who had mothers with limited knowledge, indicating that mothers with lower knowledge levels are at a higher risk of having children with developmental issues. This aligns with the research by Katharina & Iit (2017), which emphasizes the importance of maternal knowledge for early screening to detect developmental issues in children. Adequate knowledge helps form a positive attitude in mothers, influenced by factors such as education, age, and employment (Andayani & Afnuhazi, 2022). Maternal knowledge of the "Isi Piringku" program has a significant impact on child development. The study showed that the majority of children who developed according to their age had mothers with good knowledge, while most children with developmental delays had mothers with insufficient knowledge (Kasmawati dkk., 2022). The "Isi Piringku" program serves as a guide for providing nutritious food to toddlers, ensuring optimal nutritional status, which, in turn, contributes to optimal child development. According to theory, children with good nutritional status will experience normal growth, age-appropriate development, good health, appetite, and the ability to adapt to their environment (Andayani & Afnuhazi, 2022)

## **CONCLUSION**

Based on the research regarding the relationship between maternal knowledge of the "Isi Piringku" program and the nutritional status and development of toddlers at the Posyandu in Sumbang Village, which involved 76 respondents, several conclusions can be drawn. The characteristics of the mothers in the study showed an average age of 32 years, with an evenly distributed educational background at the elementary, junior high, and senior high school levels, and were predominantly non-working mothers. Meanwhile, the characteristics of the toddlers revealed an average age of 42 months, with a balanced number of male and female toddlers. The majority of the children were the second-born, with an average weight of 14.14 kg and height of 95.88 cm. The level of maternal knowledge about the "Isi Piringku" program was mostly in the sufficient category. In terms of nutritional status, the majority of toddlers were in the good nutritional category, and most of the children's development was in line with their age. The study also found a significant and very strong relationship between maternal knowledge of the "Isi Piringku" program and the nutritional status of the toddlers, indicating that the better the maternal knowledge, the better the nutritional status of the child. Additionally, there was a significant and strong relationship between maternal knowledge of the "Isi Piringku" program and the development of toddlers, suggesting that improving maternal knowledge contributes to better child development.

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