

## THE RELATIONSHIP BETWEEN BREASTFEEDING AND MATERNAL DIET DURING PREGNANCY WITH THE GROWTH AND DEVELOPMENT OF CHILDREN AGED 1-2 YEARS

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### ABSTRACT

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*Background: The first 1000 Days of Life, spanning from pregnancy until the child is two years old, is a crucial phase for human capital quality. Fetal nutritional status relies heavily on maternal intake during pregnancy, while postnatally, breast milk serves as the primary source of nutrition. Nutritional deficiencies during gestation and suboptimal breastfeeding practices can negatively impact physical growth (stunting) and cognitive development in toddlers (aged 1-2 years). Method: This study employed an observational analytic design with a cross-sectional approach. The population consisted of mothers and children aged 1-2 years in Mojo Village, Kalitidu District, Bojonegoro Regency. A sample of 30 respondents was selected using purposive sampling. Pregnancy diet data were collected using pregnancy history questionnaires, breastfeeding data via questionnaires, growth was assessed through anthropometry (Weight-for-Age, Height-for-Age), and development was measured using the Pre-Screening Developmental Questionnaire (KPSP). Data analysis was conducted using the multiple linear regression test. Result: Statistical tests using multiple linear regression tests obtained a  $p\text{-value} = 0.000 < 0.05$ , so  $H_0$  is rejected, and  $H_1$  is accepted, which means it can be concluded that there is a relationship between breastfeeding and maternal diet during pregnancy with the growth and development of children aged 1-2 years. Conclusion: There is a positive relationship between breastfeeding and maternal diet during pregnancy with the growth and development of children aged 1-2 years. Nutritional interventions must commence during the prenatal period and continue with proper lactation management.*

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### 1. INTRODUCTION

Children are the nation's most valuable asset and determine the quality of its future human resources. (Pinatitj et al., 2019). A

child's quality of life is largely determined by the growth and development processes that

occur during their early life (Beluska-Turkan et al., 2019). The most critical period in the

human life cycle is known as the "Golden Age," which occurs during the First 1,000 Days of Life (HPK). This period is calculated from conception (270 days during pregnancy) to the child's second birthday (730 days after birth) (Islami & Khourouh, 2021). During this phase, rapid physical growth occurs, and brain development reaches 80% of adult brain capacity. Failure to provide adequate nutrition and stimulation during this period can result in irreversible impacts that cannot be fully reversed later in life.

Globally, growth and developmental issues in children under five remain a major public health challenge. The World Health Organization (WHO) highlights that childhood malnutrition is a leading cause of infant mortality and long-term disability. Among the indicators of growth issues currently under global focus are stunting (short stature for age) and developmental delay. (Nursanti et al., 2025). In Indonesia, although the prevalence of stunting has decreased, it remains above the WHO standard (below 20%). According to data from the 2023 Indonesian Nutritional Status Survey (SSGI), the prevalence of stunting remains at 36.4% (Utami & Ummah, 2025). This indicates that many Indonesian children still experience stunted growth, which is at risk of being followed by stunted cognitive, motor, and socio-emotional development.

The focus of research on children aged 1-2 years (toddlers) is highly strategic. Ages 1-2 years are a transitional period from infancy to early childhood. At this age, physical growth slows slightly compared to infancy, but physical activity and motor development increase dramatically. Children begin to learn to walk, run, talk, and explore their environment. Energy and macro- and

micronutrient needs increase to support these activities. If these needs are not met,

children are susceptible to faltering growth, which manifests as weight loss or height stagnation. (Sufri et al., 2023). Furthermore, the age of 1-2 years is also a period during which a child's immune system adapts due to broader environmental exposure, making them susceptible to infectious diseases that can disrupt growth and development.

The quality of growth and development in children aged 1-2 years does not occur instantly, but rather is the accumulation of a long biological process, starting from the intrauterine period (in the womb). This is where the urgency of maternal dietary variables during pregnancy (diet during pregnancy) lies. (Ummah & Utami, 2022). The health and nutritional status of pregnant women are the main determinants of fetal health. The Fetal Programming Theory, or Barker Hypothesis, states that nutritional conditions in the womb will program the child's metabolism and future health. Pregnant women who experience Chronic Energy Deficiency (CED) or anemia due to poor diet are at risk of giving birth to babies with Low Birth Weight (LBW) (Ummah & Utami, 2024).

An inadequate maternal diet during pregnancy, lacking protein, iron, folic acid, calcium, and iodine, can disrupt the formation of vital fetal organs (organogenesis), particularly the central nervous system. (Juliandara et al., 2022). Prenatal malnutrition can reduce the number of brain cells (neurons) and inhibit myelination. The impact often only becomes apparent when a child reaches 1-2 years of age, when they may experience speech delays, fine motor skills problems, or difficulty solving simple problems compared to their peers. (Hartati & Wahyuningsih, 2021). Therefore, reviewing the mother's nutritional history during pregnancy is key to

understanding the child's current health profile.

In addition to prenatal factors, breastfeeding plays a vital role in postnatal care. Breast milk is universally recognized as the gold standard of nutrition for infants. Global recommendations advocate Early Initiation of Breastfeeding (IMD), Exclusive Breastfeeding for 6 months, and continued breastfeeding along with complementary foods (MPASI) until the child is 2 years old or older. For children aged 1-2 years, even when they are already eating solid foods, breast milk still provides a significant contribution to meeting the needs of high-quality energy, protein, and micronutrients. Furthermore, breast milk contains immunological factors (such as secretory IgA, lactoferrin, and live white blood cells) that cannot be replicated by any formula. These substances protect children from respiratory infections and diarrhea, two major causes of stunted growth in children in developing countries (Pinatitj et al., 2019).

The relationship between breastfeeding duration and child development has also been extensively studied. Long-chain polyunsaturated fatty acids, particularly docosahexaenoic acid (DHA) and arachidonic acid (AA), found in breast milk, are essential for the development of the retina and cerebral cortex. Children who are breastfed for a sufficient duration (up to 2 years) have been shown to have higher cognitive scores and IQs than those who are not breastfed or who are weaned too early. Beyond nutritional aspects, the breastfeeding process itself creates an emotional bond between mother and child. The tactile and emotional stimulation during breastfeeding provides a sense of security that forms the foundation for healthy social-emotional development in children aged 1-2 years. (Dewi et al., 2023).

However, the reality on the ground often falls short of ideal theories. In the

community, particularly in Mojo Village, Kalitidu District, Bojonegoro Regency, pregnant women still practice dietary patterns based on myths or economic constraints, resulting in unbalanced nutritional intake. Many pregnant women still adhere to the principle of "just filling up" without considering micronutrient quality. Furthermore, breastfeeding practices also face challenges. Although exclusive breastfeeding coverage may be increasing, the rate of continued breastfeeding until age 2 often declines drastically (breastfeeding dropout). Many mothers stop breastfeeding before their child is 2 years old, citing reasons such as dry milk supply, refusal, or the need to return to work, and then switch to high-sugar formula or less nutritious complementary foods.

This imbalance between a child's biological needs and parenting practices (pregnancy and breastfeeding diets) is the root of the problem. Often, child health monitoring at integrated health posts (Posyandu) or health facilities focuses solely on current weight, without delving deeply into the history of previous risk factors, namely the mother's diet during pregnancy and her breastfeeding history up to this age. However, stunting and delayed development at 1-2 years of age are manifestations of cumulative nutritional deficits from the time of conception.

Much research has been conducted on the relationship between nutrition and growth and development. However, most studies tend to be isolated: examining the effect of breastfeeding alone or the effect of maternal nutrition alone on low birth weight. (Natalia et al., 2020). Research rarely combines these two crucial variables, prenatal (pregnancy diet) and postnatal (breastfeeding), to examine their correlation.

with child outcomes in toddlerhood (1-2 years). Yet, the 1-2 years are the period when

the impact of these two factors interacts and is most evident in a child's ability to walk and talk.

Given the importance of the 1000 HPK period and the significant long-term impacts of growth and developmental disorders, an in-depth analysis of its key determinants is necessary. Based on the above description, researchers are interested in further examining "The Relationship Between Breastfeeding and Maternal Diet During Pregnancy and the Growth and Development of Children Aged 1-2 Years." This research is expected to provide empirical evidence regarding the importance of nutritional continuity from pregnancy to breastfeeding to produce a healthy, intelligent, and high-quality generation.

## 2. METODE

The research method used in this study is a survey research method. The respondents of this study were 1-2-year-old toddlers in Mojo Village, Kalitidu District, Bojonegoro Regency. The sampling technique used was purposive sampling. The independent variables in this study were breastfeeding and maternal diet during pregnancy. The dependent variable in this study was the growth and development of children aged 1-2 years. The analysis used in this study was a multiple linear regression test.

## 3. RESULTS AND DISCUSSION

From the descriptive analysis that has been carried out, the average value of each independent variable is obtained.

Maternal Diet During Pregnancy, and Growth and Development of Child Age 3 Years

No	Variable	Value			
		Mean	Max	Min	Standard Deviation
1	Breastfeeding Fulfillment	5.50	8.0	4.0	1.28
2	Dietary Patterns	9.07	12.00	7.00	1.72
3	Growth and Development	24.67	34.0	18.0	4.07

From each variable above in Table 1, it can be seen that for the Fulfillment of Breast Milk (ASI) Until the Age of 2 Years, with the smallest value of 4.0, which means low. Likewise, the total average value of 5.50 means small further with the highest value of 8.0 meaning moderate. In the variable of Maternal Diet During Pregnancy, with indicators of staple food quality, staple food frequency, and snack food quality. It can be seen that the smallest value is 7.0, meaning low, with an average value of 9.07, meaning moderate, and then with the highest value of 12.0. meaning moderate. In the dependent variable Growth and Development of Children Aged 3 Years, which has 7 indicators, the smallest value is 18, meaning moderate, and the average value of 24.67, meaning moderate. Likewise, the highest value of 34.0 means good.

Table 2. Regression Analysis of the Relationship between Breastfeeding Provision Until the Child is 2 Years Old and Maternal Diet During Pregnancy with the Growth and Development of Children Aged 3 Years

Source of Variation	Degrees of freedom	Sum of squares	f count	f 0.05	Sig
Regression	2	456.29	252.65	3.35	0.000
Error	27	24.38			
Total	29	480.67			

Table 1 Average Value of Breastfeeding Fulfillment Until Child Age 2 Years,

From Table 2, Statistical tests using multiple linear regression tests obtained p p-



value =  $0.000 < 0.05$ , so  $H_0$  is rejected, and  $H_1$  is accepted, which means it can be concluded that there is a relationship between breastfeeding and maternal diet during pregnancy with the growth and development of children aged 1-2 years in Mojo Village, Kalitidu District, Bojonegoro Regency. The F count value is 252.65, which is greater than  $F_{0.05}$ , which is 3.35 which means that the independent variables namely the fulfillment of breast milk (ASI) until the age of 2 years ( $X_1$ ), and the mother's diet during pregnancy ( $X_2$ ), together have a significant relationship to the growth and development of children aged 3 years ( $Y$ ). To find out how much influence the fulfillment of breast milk (ASI) until the age of 2 years ( $X_1$ ), and the mother's diet during pregnancy ( $X_2$ ), together on the growth and development of children aged 3 years ( $Y$ ) can be seen in the coefficient of determination ( $R^2$ ). From the results of the analysis it is known that the value of  $R^2 = 0.95$ , this means that the relationship between the fulfillment of breast milk (ASI) until the age of 2 years ( $X_1$ ), and the mother's diet during pregnancy ( $X_2$ ), together on the growth and development of children aged 3 years ( $Y$ ) is 95% while 5% is influenced by other factors.

The significant contribution of 95% confirms that, within the context of the First 1,000 Days of Life (1,000 HPK), the synergy between the prenatal (pregnancy) and postnatal (breastfeeding) phases is an inseparable foundation. This aligns with a global study published by Black et al. (2021) in The Lancet, which states that maternal and infant nutritional status is a major determinant of long-term health. Variable maternal dietary patterns during pregnancy play a key role in shaping the child's life "blueprint." During pregnancy, maternal nutrition, including macronutrients and

micronutrients such as iron, folic acid, calcium, and protein are transferred through

the placenta to support the formation of vital organs and fetal brain development (Sufri et al., 2023). The Indonesian Ministry of Health (2023) emphasized that malnutrition during this period can trigger Intrauterine Growth Restriction (IUGR), which carries the risk of low birth weight and impaired cognitive development from birth. (Natalia et al., 2020). Therefore, the positive correlation in this study demonstrates that mothers in Mojo Village who maintain the quality of their diet during pregnancy directly establish a strong foundation for their children's physical and brain development.

The success of this pregnancy phase is further enhanced by the second variable, namely the provision of breast milk until the child is two years old. (Halimah et al., 2024). The significance of this variable supports the recommendations of the World Health Organization (WHO) and the Indonesian Pediatrician Association (IDAI), which recommend continued breastfeeding until the child is two years old or beyond. (Fajriah et al., 2021). Breast milk's contribution during this period is crucial, not only as a source of supplementary nutrition, providing up to 30% of a child's energy needs in the second year, but also as a provider of immunological protective factors. Research by Victora et al. (2016) shows that breast milk contains bioactive substances, immunoglobulins, and enzymes that cannot be replicated by any formula milk, which function to protect children from recurrent infections such as diarrhea and pneumonia. (Marantika, 2021). Children who rarely get sick have a better chance of optimal growth because their body energy is not used up for recovery from illness. In addition to the physical aspects, long breastfeeding duration also strengthens the emotional bond

between mother and child. As explained by Soetjiningsih (2022), the psychological

interaction during breastfeeding provides a sense of security that stimulates a child's socio-emotional development. Therefore, 1-2-year-olds who are exclusively breastfed tend to have better emotional maturity and adaptability.

The high simultaneous determination value of 95% demonstrates that these two variables operate as a continuous, integrated system. Optimal growth and development at 3 years of age is the result of the accumulation of an unbroken nutritional chain. A mother's diet during pregnancy serves to prepare the fetus's physical and brain structures, while breastfeeding up to 2 years of age matures the immune system and enhances brain development (myelination). If one of these chains is weak, for example, if a mother eats nutritious food during pregnancy but does not breastfeed until 2 years of age, or conversely, if a mother breastfeeds diligently but experiences malnutrition during pregnancy, the child's growth and developmental potential will not be achieved optimally. These findings demonstrate that interventions to prevent stunting and developmental delays cannot be implemented in isolation but must encompass a comprehensive nutritional package from the fetal period through weaning.

Although the influence of these two variables is very dominant, this study also noted a residual factor of 5% that influences child growth and development. Referring to Hurlock's developmental theory (2018) and H.L. Blum's health determinants, this residual influence likely stems from genetic factors (heredity), environmental stimulation outside of breastfeeding, residential sanitation, and access to basic health services such as immunizations. (Karavida et al., 2019). Although small in this

study, these factors still play a supporting role. However, the 95% dominance of

maternal nutrition and breastfeeding variables confirms that without an adequate nutritional foundation, neither good genetic factors nor environmental stimulation will be sufficient to support optimal child growth.

Overall, this study concludes that the growth and development status of 3-year-old children in Mojo Village is highly dependent on consistent nutritional support from conception to the end of the breastfeeding period. The implications of these findings emphasize the need to strengthen maternal and child health programs that focus on preconception nutrition education, monitoring maternal intake, and intensive support for breastfeeding mothers to ensure they are able to breastfeed for up to two years. This joint effort is the most strategic and effective step to break the chain of growth and development problems and create a healthy and intelligent golden generation.

#### **4. CONCLUSION**

There was a relationship between breastfeeding and maternal diet during pregnancy with the growth and development of children aged 1-2 years in Mojo Village, Kalitidu District, Bojonegoro Regency. Health workers are recommended to strengthen nutritional counseling during pregnancy (prenatal) and ensure continued lactation support until the child is two years old. For mothers, improving diet quality during pregnancy and breastfeeding has been proven to be the main foundation for the growth and development of children aged 1-2 years. The synergy between providing fetal nutrition and breastfeeding is a strategic key to optimizing the golden period (1000 HPK), preventing stunting, and maximizing the potential for children's

cognitive and physical development in the future.

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