



The Relationship Between Maternal Education Level and Infant Nutritional Status

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Abstract. Infant nutritional status is an important indicator of child health that is influenced by various factors, including maternal characteristics. Maternal education is often considered to play a role in determining infant care and feeding practices. This study aims to analyze the relationship between the mother's education level and infant nutritional status. The study uses a quantitative approach with a cross-sectional analytical observational design. The study sample consisted of 30 mothers and infants aged 0–12 months selected using purposive sampling. Maternal education level was categorized as elementary, secondary, and higher education, while infant nutritional status was determined based on anthropometric indicators according to WHO standards and the position of the Health Card (KMS). Data analysis was performed bivariate using Spearman's rho correlation test with a significance level of $p < 0.05$. The results of the study indicate that there is no significant relationship between the mother's level of education and the nutritional status of the infant ($p = 0.575$; $r = -0.098$). The correlation coefficient value indicates a very weak and statistically insignificant relationship. The conclusion of this study indicates that the mother's education level is not a factor directly related to the nutritional status of infants. The nutritional status of infants is likely to be more influenced by other more proximal factors, such as feeding practices, the quality and quantity of food intake, the child's health condition, and the family's environmental and socioeconomic factors.

Keyword: Child Nutrition; Infant Nutritional Status; KMS; Maternal Education; Social Factors

1. INTRODUCTION

Maternal education is one of the important factors that influence infant health and nutrition. Various studies show that higher levels of education are often associated with a better understanding of nutrition, health, and child care. According to the World Health Organization (WHO), good infant nutrition is essential for their growth and development, which in turn affects their future quality of life (WHO, 2020). In this context, it is important to understand how maternal education plays a role in determining infant nutrition, especially in developing countries where nutrition remains a major challenge.

The nutritional status of infants and toddlers is an important indicator of public health because it reflects adequate nutritional intake, parenting patterns, health conditions, and the environment in which children grow up. Poor nutritional status (especially stunting, wasting, and underweight) is associated with increased susceptibility to infectious diseases, growth and development barriers, and the risk of death in children. The WHO emphasizes that nutrition-related factors contribute to approximately 45% of deaths in children under 5 years of age, making the prevention of nutritional problems a priority for maternal and child health services. The assessment of infant/toddler nutritional status generally uses the WHO child growth

standards, which can be applied to all children regardless of ethnicity and socioeconomic status (WHO, 2022; 2025).

In Indonesia, nutrition problems among toddlers remain a challenge, particularly stunting as a form of chronic malnutrition. The 2023 Indonesian Health Survey (SKI) recorded a national stunting prevalence of 21.5%, indicating that around 1 in 5 toddlers still experience growth disorders due to long-term malnutrition. The government also reported the latest developments through the 2024 SSGI, namely that the national prevalence of stunting had fallen to 19.8% in 2024, but this achievement still requires acceleration to meet the next national development targets. The data shows that the determinants of children's nutritional status need to be examined more specifically so that interventions to prevent malnutrition are on target, including social factors such as maternal education (Ministry of Health, 2023; UNICEF, 2020).

Data from the Indonesian Central Statistics Agency (BPS) shows that the stunting rate among children under five years of age remains quite high, reaching 27.67% in 2021 (BPS, 2021). Stunting, which is an indicator of chronic malnutrition, is often linked to parenting practices and mothers' understanding of nutrition. With lower levels of education, mothers may lack accurate information about their children's nutritional needs, which can contribute to nutritional problems such as stunting and wasting (Indonesian Ministry of Health, 2020).

Conceptually, UNICEF places education and the socioeconomic status of families as "fundamental" determinants that influence family food availability, parenting and feeding practices, and access to health and sanitation services, which ultimately impact children's nutritional status. Mothers with higher education tend to have better health literacy, are better able to understand nutritional information (e.g., exclusive breastfeeding, adequate complementary feeding, infection prevention), and are more effective in making health decisions for their babies. Maternal education is also often associated with service-seeking practices (antenatal care, health posts/immunization, growth monitoring), as well as the family's ability to manage resources to meet the nutritional needs of children. Thus, maternal education is considered an important factor that can explain differences in infant nutritional status in communities (UNICEF. (2020); Rezaeizadeh, G., et al. (2024).

Empirical evidence supports this relationship, including in Indonesia, where national data-based analytical research shows that maternal education is associated with stunting in children (Laksono, A. D., Wulandari, R. D., Amaliah, N., & Wisnuwardani, R. W. (2022). A PLoS ONE study of children under 2 years of age in Indonesia concluded that the lower the mother's education, the greater the chance of the child experiencing stunting, confirming the

role of maternal education as an important determinant of nutritional status (Laksono, A. D., Wulandari, R. D., Amaliah, N., & Wisnuwardani, R. W. (2022). Another study on working mothers in Indonesia also found that maternal education is one of the factors that influence stunting in toddlers. (Laksono, A. D., Wulandari, R. D., Amaliah, N., & Wisnuwardani, R. W. (2022). Global findings are also consistent, with systematic reviews and meta-analyses reporting the influence of maternal education on child growth from birth to early childhood, thereby strengthening the scientific basis that maternal education is relevant as a determinant of nutritional status. Rezaeizadeh, G., et al. (2024).

A study in West Java shows that mothers with higher education tend to provide better nutrition to their children compared to mothers with lower education (Sari, 2019). Adequate knowledge of nutrition enables mothers to make better decisions in choosing foods and understand the importance of exclusive breastfeeding during the first six months of a baby's life. This shows that education not only influences knowledge, but also the attitudes and behaviors of mothers in caring for their children.

Furthermore, maternal education is also related to access to health services and nutritional information. Mothers with higher levels of education tend to be more active in seeking information about health and nutrition, and are more likely to utilize available health services (Hidayati, 2021). This is important because good access to health services can assist in the prevention and treatment of nutritional problems in infants, such as immunization and treatment of diseases that can affect appetite and nutrient absorption.

However, at the service and community levels, the relationship between maternal education and infant nutritional status can vary due to intermediary factors such as family income, food security, quality of complementary foods, incidence of infection, and access to clean water and sanitation. Therefore, research entitled "The Relationship between Maternal Education Level and Infant Nutritional Status" is important to produce region-specific local evidence that can be used to strengthen nutrition education strategies, infant and child feeding counseling, and stunting prevention programs and other nutritional issues in primary health care services (posyandu/puskesmas) (UNICEF. (2020).

2. RESEARCH METHOD

This study used a quantitative approach with an analytical observational design through a cross-sectional method. This design was chosen because the study aimed to determine the relationship between the mother's education level and the nutritional status of the baby, where the independent and dependent variables were measured simultaneously at one point in time

without providing any intervention to the respondents. The cross-sectional design is considered appropriate for identifying relationships between variables in populations of mothers and infants in primary health care or community settings.

The population in this study consisted of all mothers with infants aged 0–12 months who were registered and visited health centers or health facilities in the study area. The study sample consisted of a subset of mothers and infants who met the inclusion criteria, namely mothers who had infants aged 0–12 months, had clear data on their latest education, had infants who were in good health at the time of measurement, and were willing to be respondents. The exclusion criteria included infants with congenital abnormalities, infants who were seriously ill at the time of measurement, or incomplete data.

The sample size is determined based on total sampling or purposive sampling, depending on the available population size. If the number of mothers and infants at the research site is relatively small and manageable, total sampling is used, whereby the entire population is used as the sample. However, if the population size is large, purposive sampling is used, with a minimum sample size of 35 respondents, which statistically meets the requirements for relationship analysis in obstetric observational research.

The sampling technique used was purposive sampling, which is the selection of respondents based on specific criteria in line with the research objectives. This technique was chosen because the researchers needed respondents with specific characteristics, namely mothers who had babies and had data on their babies' education and nutritional status that could be measured objectively.

The independent variable in this study was the mother's level of education, which was categorized as primary, secondary, and higher education. The dependent variable was the nutritional status of the infant, which was determined based on anthropometric indicators (weight-for-age or length-for-age) and classified according to WHO standards as malnourished, underweight, well-nourished, and overweight. Data on the mother's education was obtained through questionnaires or secondary data (KIA books), while the nutritional status of infants was obtained through anthropometric measurements using standardized scales and height measuring devices.

Data analysis was conducted in stages. Univariate analysis was used to describe the distribution of respondent characteristics, including maternal education level and infant nutritional status categories. Bivariate analysis was conducted to determine the relationship between maternal education level and infant nutritional status. The statistical test used was Spearman's Rho test. If there were cells with an expected count <5 , Fisher's Exact test was used

as an alternative. The level of statistical significance was set at a p-value < 0.05, indicating a significant relationship between the mother's education level and the infant's nutritional status.

3. RESULTS AND DISCUSSION

Table 1. Demographic data.

	Var	n	F (%)
Age	< 20 years old	1	3.3
	20-35 years old	19	63.3
	>35 years old	10	33.3
Education	Elementary school	2	6.7
	Junior High School	5	16.7
	High School	19	63.3
	College/university	4	13.3
Employment	Housewife	23	76.7
	Farmer	0	0
	Private employee	5	16.7
	Government employee	2	6.7
Gender (infant)	Male	17	56.7
	Female	13	43.3
Children's snacks	Poor	0	0
	Fair	9	30.0
	Good	21	70.0
Food quality	Poor	2	6.7
	Fair	13	43.3
	Good	15	50.0
Food quantity	Poor	4	13.3
	Fair	2	6.7
	Good	24	80.0
KMS position	Green	4	13.3
	Yellow	6	20.0
	Orange	20	66.7
	Red	0	0
Total		30	100

Source: primary data, 2025.

Based on the respondent characteristics table, out of a total of 30 respondents, most mothers were in the 20–35 age group, namely 19 people (63.3%), which is the healthy reproductive age. There were 10 respondents (33.3%) aged >35 years, while only 1 respondent (3.3%) was aged <20 years. In terms of education level, the majority of respondents had a high school education, totaling 19 people (63.3%). Respondents with junior high school education numbered 5 (16.7%), college education numbered 4 (13.3%), and elementary school education numbered 2 (6.7%). This shows that the respondents' education level was dominated by secondary education. Based on employment status, most respondents were housewives, totaling 23 people (76.7%). Respondents who worked as private employees numbered 5 people

(16.7%), and civil servants numbered 2 people (6.7%). There were no respondents who worked as farmers.

Based on the characteristics of the infants, most of them were male, namely 17 infants (56.7%), while there were 13 female infants (43.3%). Based on the children's snack consumption patterns, the majority of respondents were in the good category, namely 21 children (70.0%), while 9 children (30.0%) were in the adequate category, and there were no children in the poor category. In terms of food quality, half of the respondents were in the good category, namely 15 children (50.0%), while 13 children (43.3%) were in the sufficient category and 2 children (6.7%) were in the poor category. In terms of food quantity, most children were in the good category, namely 24 children (80.0%). Children with poor food quantity numbered 4 (13.3%), and those in the adequate category numbered 2 (6.7%).

Based on the Healthy Card (KMS) position, most children are in the orange zone, namely 20 children (66.7%), followed by 6 children (20.0%) in the yellow zone, and 4 children (13.3%) in the green zone. There are no children in the red zone.

Table 2. Statistik analysis.

Independent variable	n	P Value	r	Dependent variable
Education	35	0.575	-0.098	Infant nutritional status

Spearman's rho

Source: primary data, 2025.

Based on the results of statistical analysis using the Spearman rho correlation test, a p-value of 0.575 ($p > 0.05$) was obtained with a correlation coefficient of $r = -0.098$. These results indicate that there is no statistically significant relationship between the mother's education level and the infant's nutritional status.

A very weak and negative correlation coefficient indicates that the relationship between the two variables is very low and insignificant. This means that an increase or difference in the educational level of the mothers in this study was not followed by a significant change in the nutritional status of their babies.

Thus, it can be concluded that in this study, the mother's level of education is not a factor directly related to the nutritional status of infants. This condition indicates that the nutritional status of infants is likely to be more influenced by other factors, such as feeding practices, the quality and quantity of food intake, the child's health condition, and the family's environmental and socioeconomic factors.

Discussion

The Spearman rho test results show a p-value of 0.575 ($p > 0.05$) with a correlation coefficient of $r = -0.098$, so it can be concluded that there is no significant relationship between the mother's education level and the nutritional status of the baby in this study. The very small r value indicates that the relationship is very weak and practically meaningless.

In theory, maternal education is often considered to play a role in children's nutritional status through increased knowledge, health behaviors, feeding practices, and access to services. In UNICEF's Conceptual Framework (2020), children's nutritional status is influenced by direct causes (intake and disease), indirect causes (household food security, parenting/feeding practices, health services, and environment), and underlying causes (socioeconomic conditions, resources, and norms). Maternal education is a "foundational/structural" determinant that works indirectly through these pathways, so its influence can be "masked" when other factors are more dominant (UNICEF. (2020).

The insignificant findings in this study are still reasonable because the relationship between education and nutrition is not always apparent in all populations and research designs. A recent meta-analysis shows that maternal education is generally associated with child growth indicators, but the magnitude of the effect can vary between countries and contexts, and is influenced by mediators such as socioeconomic conditions and feeding practices (Rezaeizadeh, G., et al. (2024). In Indonesia, a large study also found that maternal education is associated with stunting in toddlers, especially when other factors are controlled for in multivariate analysis (Laksono, A. D., et al. (2022). However, there are also studies that report no significant relationship between maternal education and stunting in certain contexts (e.g., West Java), confirming that nutritional determinants are complex and highly contextual (Rahayuwati, L., et al. (2023).

In your data, the insignificance of this relationship is likely influenced by several factors:

- a. Sample size/insufficient power: with a small sample, the chance of detecting a real relationship is lower, especially when nutritional status variation is limited or the distribution of education is unbalanced. "Insignificant" findings may occur even though there is a relationship in the population (Rahayuwati, L., et al. (2023).
- b. The dominance of other more proximate factors: feeding practices (food quality/quantity, snacks), history of disease/infection, and sanitation more directly affect nutritional status than formal education. WHO guidelines on complementary feeding emphasize quality,

diversity, and adequacy of intake at 6–23 months of age as key factors for growth (World Health Organization. (2023).

- c. Access to nutrition services and programs: when education and growth monitoring (e.g., posyandu/KMS) are effective, mothers with low levels of education can still obtain sufficient practical information, thereby reducing nutritional disparities between different levels of education. The UNICEF framework also emphasizes the role of services/practices and environmental support as important determinants (UNICEF. (2020).

Overall, the results of this study indicate that maternal education alone is not sufficient to explain the variation in infant nutritional status in your sample. Therefore, further research is recommended to include more proximal factors such as feeding practices, frequency of illness/infection, parenting styles, and socioeconomic factors, as well as using multivariate analysis to clarify the pathways of educational influence (Prasetyo, Y. B., et al. (2023).

4. CONCLUSION

Based on the results of statistical analysis using the Spearman rho test, it can be concluded that there is no significant relationship between the mother's level of education and the nutritional status of the baby. The test results show a p-value of 0.575 ($p > 0.05$) with a correlation coefficient of $r = -0.098$, which indicates a very weak and statistically insignificant relationship.

These findings indicate that maternal education level is not a factor directly related to infant nutritional status in this study. This suggests that infant nutritional status is more likely to be influenced by other, more proximal factors, such as feeding practices, food quality and quantity, child health, and family socioeconomic and environmental factors.

Thus, efforts to improve infant nutritional status need to focus on a more comprehensive approach, not only improving mothers' formal education, but also strengthening practical nutrition education, growth monitoring, and health service support at the family and community levels.

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