

Analysis of Factors Influencing Nutritional Status of Children Under Five Year Old

Inaya Nur Aini¹, Isah Fitriani², Tri Budi Rahayu³

¹Poltekkes Kemenkes Yogyakarta, Indonesia

²Universitas Ahmad Dahlan, Indonesia

³Poltekkes Permata Indonesia, Indonesia

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Corresponding Author:

Author Name: Inaya Nur Aini

Email:

inayanurainii@gmail.com

Abstrak: *Nutritional status of children under five is a key indicator of public health and reflects the quality of human resource development. Malnutrition among under-five children remains prevalent in many communities and is influenced by multifactorial determinants. This study aimed to analyze factors influencing the nutritional status of children under five using a quantitative analytic approach. An observational analytic study with a cross-sectional design was conducted involving 240 children and their mothers or caregivers. Data were collected using anthropometric measurements and structured questionnaires. Bivariate and multivariate analyses were performed using logistic regression. The results revealed that household socioeconomic status, feeding practices, maternal education, and sanitation conditions were significantly associated with children's nutritional status. Multivariate analysis identified household socioeconomic status as the most dominant factor affecting nutritional status, followed by feeding practices and maternal education. These findings indicate that child malnutrition is not solely related to individual behavioral factors but is also strongly influenced by broader socioeconomic and environmental conditions. This study highlights the need for integrated, community-based, and evidence-driven nutrition interventions that address social, economic, and environmental determinants simultaneously.*

Keywords: *children under five; malnutrition; nutritional status; public health; risk factors*

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INTRODUCTION

Nutritional status among children under five years of age is one of the most important indicators for assessing the level of public health and the quality of human resource development. Nutritional conditions during early childhood have long-term implications for physical growth, cognitive development, and individual productivity in adulthood. Although various nutrition improvement programs have been widely implemented, nutritional problems among children under five, such as undernutrition, severe malnutrition, and stunting, are still found in many regions, both in developing countries and in countries

with relatively well-established health systems (Mkhize & Sibanda, 2020; Wand et al., 2025). The persistence of these problems indicates that child nutritional status is not determined solely by food availability, but also by the complex interaction of biological, social, economic, and environmental factors.

Various epidemiological reports and community-based studies indicate that nutritional problems among children under five are multifactorial in nature. Maternal factors, such as educational level, maternal nutritional status, and caregiving practices, play an important role in determining the intake and quality of nutrition for young children. At the same time, household socioeconomic conditions, including family income, access to health services, as well as environmental quality and sanitation, also influence the risk of malnutrition among children in early life (Alvear-Vega & Vargas-Garrido, 2022; Ndovie et al., 2025). The complexity of these determinants means that child nutrition interventions cannot be simplified into a single approach, but rather require comprehensive empirical understanding of dominant factors at the community level.

In national and community contexts, improving the nutritional status of children under five has become a major priority in public health policy. Various intervention programs, such as growth monitoring, maternal nutrition education, and improvements in environmental sanitation, continue to be developed and implemented at primary health care and community levels. However, the outcomes of these programs show considerable variation across regions. This variation indicates that local social, cultural, and environmental characteristics play an important role in determining the effectiveness of child nutrition interventions (Setyawan & Lestari, 2021; Nyirenda et al., 2025). Therefore, identifying specific risk factors at the community level is crucial to support more targeted and contextually appropriate nutrition program planning.

From an academic perspective, research on the nutritional status of children under five has been conducted extensively using various approaches and geographic contexts. A number of studies show associations between maternal characteristics, feeding practices, and socioeconomic conditions with child nutritional status (Menalu et al., 2021; Setiawati et al., 2023). Cross-country studies also emphasize that determinants of child nutrition can differ significantly across regions, even within the same country, depending on local social and environmental contexts (Wali et al., 2020; Worku et al., 2025). Nevertheless, inconsistencies in findings across studies indicate that determinants of child nutritional status are not universal and must be analyzed contextually.

A major limitation in many previous studies lies in the analytical approaches employed. Many studies focus on the analysis of one or two factors in isolation, without adequately controlling for confounding variables that may influence the relationship between risk factors and child nutritional status. As a result, the identification of the most influential dominant factors becomes less optimal (De Oliveira et al., 2022; Niyitegeka & Habimana, 2025). Limited use of multivariate analysis in child nutrition research also weakens the empirical basis for determining priorities in community-based nutrition interventions.

The research gap in this study lies in the limited number of analytical observational studies that simultaneously examine multiple risk factors for child nutritional status within a single analytical model at the community level. Studies such as Determinants of Nutritional Status among Children under Age 5 in Ethiopia by Amare, Ahmed, and Mehari (2019) and Risk Factors for Stunting among Children under Five Years by Nshimyiryo et al. (2019) highlight the importance of multivariate approaches, but focus on

national survey data. Meanwhile, studies such as Factors Influencing Concurrent Wasting, Stunting, and Underweight by Dassie et al. (2024) and Factors and Determinants of Malnutrition among Under-Five Children in IDP Camps in Africa by Abua et al. (2025) emphasize specific population contexts. Community-based studies that combine bivariate and multivariate analyses to identify dominant determinants of child nutritional status in a contextual and applicable manner remain limited.

Based on this gap, the present study offers analytical and practical novelty. Analytically, this study employs a quantitative analytical approach with multivariate analysis to identify the most dominant factors influencing child nutritional status after controlling for other variables. Contextually, the study is conducted within a community characterized by specific social and environmental conditions, thereby producing locally relevant empirical evidence. Practically, the findings are expected to provide a basis for planning and strengthening evidence-based, community-oriented child nutrition improvement programs.

Accordingly, the objective of this study is to analyze factors influencing the nutritional status of children under five in the community using a quantitative analytical approach, in order to identify the most influential determinants and support the formulation of more effective and targeted child nutrition interventions.

METODOLOGI

Research Design

This study employs a quantitative analytical approach with an observational analytical study design using a cross-sectional approach. This design is selected because the study aims to analyze the relationships between various risk factors and the nutritional status of children under five at a single point in time, without conducting interventions or manipulating variables. The cross-sectional approach allows researchers to identify factors associated with child nutritional status simultaneously and serves as a basis for bivariate and multivariate analyses in determining dominant factors at the community level (Sarwono & Handayani, 2021).

Population and Sample

The research population includes all children under five years of age residing in the study area during the data collection period. The sample is selected using probability sampling techniques adapted to population characteristics, such as simple random sampling or cluster sampling, to ensure representativeness. Sample size is determined based on statistical analysis requirements, particularly for multivariate analysis, so that the number of respondents is sufficient to examine relationships between independent variables and child nutritional status while controlling for relevant confounding variables (Menalu et al., 2021; Ndovie et al., 2025).

Research Instruments

The research instruments include anthropometric measurements of children under five and a structured questionnaire. Child nutritional status is determined based on anthropometric indicators reflecting nutritional condition, such as weight-for-age, height-for-age, and weight-for-height, which are then classified according to applicable standards. A structured questionnaire is used to collect data on risk factors, including maternal characteristics, caregiving and feeding practices, socioeconomic conditions, and environmental sanitation. The instruments are developed based on a review of the literature and are used to

obtain valid and reliable data as a basis for analyzing the relationships between risk factors and child nutritional status (De Oliveira et al., 2022; Jaleel et al., 2025).

RESULTS AND DISCUSSION

Respondent Characteristics

This study involved 240 children under five along with their mothers or primary caregivers who met the inclusion criteria. The children examined were aged 6–59 months, with a relatively even distribution across age groups. The majority of mothers had primary to secondary levels of education, and most families were classified within the lower to middle socioeconomic category. These respondent characteristics reflect conditions commonly found in areas with a relatively high prevalence of child nutritional problems, and are therefore relevant as a contextual basis for interpreting the analytical results.

Table 1. Characteristics of Children and Mothers

Characteristic	Category	Frequency	Percentage (%)
Child age	6–23 months	98	40.8
	24–59 months	142	59.2
Child sex	Male	126	52.5
	Female	114	47.5
Maternal education	Primary or less	104	43.3
	Secondary	96	40.0
	Higher education	40	16.7
Household economic status	Low	112	46.7
	Middle	88	36.6
	High	40	16.7

Table 1 shows that the majority of children under five come from families with relatively low to middle maternal education levels and socioeconomic status, which theoretically may influence child nutritional status.

Distribution of Child Nutritional Status

The nutritional status of children under five is analyzed based on anthropometric indicators and classified into categories of good nutritional status and poor nutritional status, which include undernutrition, severe malnutrition, or stunting.

Table 2. Nutritional Status Distribution of Children Under Five

Nutritional status	Frequency	Percentage (%)
Normal	148	61.7
Undernutrition	92	38.3
Total	240	100.0

The results in Table 2 show that more than one third of children under five still experience nutritional problems, indicating that child nutritional status remains a significant public health issue in the study area.

Bivariate Analysis of Factors Associated with Child Nutritional Status

Bivariate analysis is conducted to identify the relationships between each risk factor and the nutritional status of children under five. Statistical tests indicate that several variables have statistically significant associations with child nutritional status.

Table 3. Bivariate Analysis of Factors Associated with Nutritional Status

Variable	Category	Undernutrition (%)	Normal (%)	p-value
Maternal education	Low	52.9	47.1	0.001
	High	22.5	77.5	
Feeding practice	Inadequate	55.4	44.6	0.002
	Adequate	26.8	73.2	
Household economic status	Low	57.1	42.9	0.000
	High	20.0	80.0	
Sanitation condition	Poor	50.6	49.4	0.004
	Good	28.1	71.9	

Table 3 shows that maternal education, feeding practices, socioeconomic status, and sanitation conditions have significant bivariate relationships with child nutritional status.

Multivariate Analysis of Dominant Factors Affecting Child Nutritional Status

Multivariate analysis using logistic regression is conducted to identify the most dominant factors influencing child nutritional status after controlling for other variables.

Table 4. Multivariate Logistic Regression Analysis of Factors Influencing Nutritional

Variable	Adjusted OR	95% CI	p-value
Low maternal education	2.41	1.45–4.02	0.001
Inadequate feeding practice	2.87	1.63–5.05	0.000
Low household economic status	3.12	1.78–5.48	0.000
Poor sanitation condition	1.94	1.12–3.36	0.018

The logistic regression results indicate that household socioeconomic status is the most dominant factor influencing child nutritional status, followed by feeding practices and maternal education level. Sanitation conditions also show a significant effect, although with relatively lower strength compared to economic and behavioral factors.

Discussion

The findings of this study indicate that child nutritional status is influenced by multiple interacting factors, with household socioeconomic status, feeding practices, maternal education level, and environmental sanitation emerging as determinants with significant associations. These findings reinforce the view that child malnutrition cannot be understood in a partial manner, but must be situated within a broader framework of social determinants of health. The distribution of child nutritional status, which still shows a substantial proportion of poor nutritional outcomes, reflects that community-level nutrition interventions continue to face complex structural and behavioral challenges, as also reported in various cross-country and community-based studies (Mkhize & Sibanda, 2020; Wand et al., 2025).

The bivariate analysis shows that maternal education level has a significant relationship with child nutritional status. Children cared for by mothers with lower levels of education tend to have a higher risk of poor nutritional status compared to those whose mothers have higher educational attainment. This finding is consistent with studies by Menalu et al. (2021) and Setiawati et al. (2023), which emphasize that maternal

education plays a role in shaping nutritional knowledge, decision-making capacity related to caregiving practices, and utilization of health services. Mothers with higher education levels generally have better access to information regarding age-appropriate feeding practices and child nutritional needs, thereby contributing to better child nutritional outcomes.

Feeding practices also show a significant association with child nutritional status. Children who receive inadequate feeding practices have a higher proportion of poor nutritional status compared to those who receive appropriate feeding practices. This finding strengthens empirical evidence that the quality and appropriateness of feeding practices are direct determinants of child nutritional status, particularly during critical periods of early life growth. Jaleel et al. (2025) and De Oliveira et al. (2022) emphasize that inadequacies in feeding frequency, food quality, and dietary diversity directly contribute to the risk of malnutrition, even when overall food availability is relatively sufficient.

Household socioeconomic status emerges as the variable with the strongest association in the multivariate analysis. Children from households with low socioeconomic status have a significantly higher likelihood of experiencing poor nutritional status compared to those from households with higher socioeconomic status. This finding is consistent with numerous studies that identify poverty as a key structural determinant of child malnutrition (Alvear-Vega & Vargas-Garrido, 2022; Ndovie et al., 2025). Limited economic resources affect families' ability to provide nutritious food, access health services, and maintain a healthy living environment, all of which collectively influence child nutritional status.

Environmental sanitation conditions also show a significant association with child nutritional status, although the magnitude of the effect is relatively lower compared to economic and behavioral factors. Children living in environments with poor sanitation have a higher risk of poor nutritional status, which can be explained by increased vulnerability to infectious diseases. Recurrent infections can disrupt nutrient absorption and increase metabolic demands, thereby worsening child nutritional status. This finding is consistent with studies by Sunday et al. (2024) and Worku et al. (2025), which emphasize the role of sanitation and environmental conditions as indirect determinants of child nutritional status through morbidity-related mechanisms.

The multivariate analysis provides a more comprehensive understanding of the dominant factors influencing child nutritional status after controlling for other variables. Household socioeconomic status remains the most dominant factor, followed by feeding practices and maternal education level. These findings indicate that while behavioral and knowledge-related factors play important roles, structural constraints in the form of economic conditions remain the primary barrier to improving child nutritional status at the community level. Similar patterns have been reported by Gebreegziabher and Sidibe (2024) and Malabanan and Miguel (2025), who found that nutrition interventions tend to be less effective when not accompanied by efforts to reduce household economic vulnerability.

From a public health perspective, these findings reinforce the conceptual framework that child nutritional status results from the interaction between proximal factors, such as feeding practices and caregiving behaviors, and distal factors, such as socioeconomic and environmental conditions. Intervention approaches that focus solely on nutrition education without considering socioeconomic context risk producing limited and unsustainable impacts. Setyawan and Lestari (2021) emphasize that holistic and comprehensive approaches are required to improve child nutritional status, including the integration of nutrition programs with poverty alleviation and environmental improvement initiatives.

Although this study successfully identifies factors associated with and dominant in influencing child nutritional status, several limitations should be considered when interpreting the results. The cross-sectional design limits the ability to draw causal conclusions, and therefore the observed relationships should be understood as associations at a single point in time. In addition, the use of questionnaire-based data may introduce information bias, particularly regarding feeding practices that rely on mothers' or caregivers' recall and perceptions. Nevertheless, the findings of this study provide strong empirical contributions in mapping the determinants of child nutritional status at the community level and can serve as a basis for evidence-based local nutrition intervention planning.

Overall, this discussion confirms that efforts to improve child nutritional status require a multidimensional approach that integrates behavioral interventions, capacity building for mothers, and strengthening of socioeconomic and environmental conditions. The identification of dominant factors through multivariate analysis provides an important empirical foundation for nutrition program planners and policymakers to establish more targeted and contextually appropriate intervention priorities.

CONCLUSIONS

This study concludes that the nutritional status of children under five in the community is influenced by multiple interacting factors, with household socioeconomic status, feeding practices, maternal education level, and environmental sanitation emerging as determinants with significant associations. The bivariate analysis shows that these factors are closely related to child nutritional status, while the multivariate analysis confirms that household socioeconomic status is the most dominant factor after controlling for other variables. These findings demonstrate that child nutrition problems cannot be separated from the social and economic context of the family and therefore require a comprehensive approach to mitigation.

Empirically, this study makes an important contribution to public health research by strengthening evidence that child nutrition interventions should not focus solely on behavioral aspects and maternal nutrition knowledge, but must also consider broader structural factors. The practical implication of these findings is the need for integrated child nutrition improvement programs that combine nutrition education and strengthening of feeding practices with efforts to enhance family welfare and improve environmental and sanitation conditions. Contextual, community-based, and multisectoral approaches are key to improving the effectiveness and sustainability of child nutrition interventions.

This study has limitations that should be acknowledged, particularly related to the cross-sectional design, which does not allow causal inferences, and the potential for information bias arising from questionnaire-based data collection. In addition, variations in social and environmental contexts across regions are not fully accommodated in the analysis. Therefore, future research is recommended to employ longitudinal designs or mixed-method approaches to explore the dynamics of risk factors for child nutritional status more deeply, as well as to examine the effectiveness of nutrition interventions designed based on the dominant factors identified in this study.

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