

Analysis of the relationship between feeding patterns and the risk of stunting in toddlers at Piyungan Health Center, Bantul

Fitriatul Ulfa, Herlin Fitriana Kurniawati

Universitas 'Aisyiyah Yogyakarta, Indonesia

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ABSTRACT

Background: Stunting remains a critical public health issue in Indonesia, especially among children under five, due to chronic nutritional deficiencies. Inadequate feeding practices in early childhood are one of the primary contributing factors. Despite existing health interventions, behavioral determinants such as feeding patterns remain underexplored, particularly in rural communities with unique sociocultural dynamics.

Aims: This study aims to analyze the relationship between feeding patterns and the incidence of stunting among children aged 1–5 years in the working area of Puskesmas Piyungan, Bantul, Yogyakarta.

Methods: A correlational study design with a cross-sectional approach was adopted. Data were collected from 32 purposively selected mother-child dyads from three community health posts. Feeding patterns were assessed through a validated structured questionnaire, and child height was measured using a microtoise. Chi-square tests were applied to examine associations between variables.

Results: The study revealed that 83.3% of children with good feeding patterns had normal nutritional status, while 90% of those with poor feeding patterns were stunted. Statistical analysis indicated a significant relationship between feeding patterns and stunting incidence ($p = 0.002$).

Conclusion: The findings underscore the significant influence of maternal feeding behavior on child nutritional outcomes. Improved feeding practices were strongly associated with normal growth, whereas inadequate feeding correlated with high stunting rates. This study advocates for family-centered nutrition education and the reinforcement of community health services, particularly through Posyandu, as strategic measures to combat stunting. The insights contribute to evidence-based policymaking and can inform the design of targeted interventions addressing behavioral causes of malnutrition. Future research with larger samples and longitudinal designs is recommended to evaluate long-term effects and support sustainable nutritional development programs.

Keyword: Toddler, Feeding patterns, Nutritional status, Posyandu, Stunting.

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INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) in Indonesia are a key pillar in national economic development. Its crucial role in creating jobs, reducing poverty, and contributing to Gross Domestic Product (GDP), makes this sector strategic in sustaining national economic resilience (Kusumaningtyas et al., 2022; Nasution et al., 2025; Nursini, 2020). Based on BPS 2018-2019 data, more than 98% of business units in Indonesia are MSMEs, with the majority being micro businesses. This shows that the potential of MSMEs is very large in driving the economy, especially at the local level (Lin et al., 2022; Singh & Paliwal, 2017; Varga, 2021). In the context of globalisation and regional economic integration through the ASEAN Economic Community (AEC), Indonesia has become part of the ASEAN Comprehensive Investment Agreement (ACIA) which is designed to encourage foreign direct investment (FDI) into the ASEAN region, including into sectors relevant to the people's economy such as MSMEs (Anggadini et al., 2023; Mustafa & Komalasari, 2024).

However, there is a gap between the idealised expectations and the real conditions on the ground. In the ideal scheme, ACIA is expected to open wider access for MSMEs to resources, technology, and global markets through partnerships with foreign investors. However, in reality, MSME actors in Indonesia still face various structural barriers, such as limited capital, low human resource capacity, limited technology utilisation, and narrow access to foreign markets (Aggarwal & Joshi, 2024; Saifurrahman & Kassim, 2023).

Furthermore, the dominance of large businesses in the investment realm tends to marginalise the role of MSMEs in regional supply chains. This situation shows that although Indonesia has formally complied with ACIA, its implementation has not been fully orientated towards strengthening MSMEs as strategic economic actors (Sulaeman et al., 2024; Suryawati et al., 2025). This provides an important opportunity for research that critically examines Indonesia's compliance with the ACIA regime and its impact on the development of MSMEs. Since the ratification of ACIA through Presidential Regulation No. 49 Year 2011, the Government of Indonesia has initiated a number of collaborative policies, such as encouraging foreign investors to partner with MSME actors.

However, the extent to which the policy is effective in improving the quality and competitiveness of MSMEs has not been widely evaluated in an academic context. Therefore, this research becomes relevant to provide a more complete picture of the implementation of ACIA in supporting the strengthening of the MSME sector in Indonesia. Although various studies have discussed ASEAN economic integration and its implications for the investment sector, studies that specifically highlight the link between Indonesia's compliance with the ACIA regime and its influence on MSMEs are still minimal (Marchese, 2021; Nuryanah et al., 2023; Waspiah et al., 2020). Most of the literature focuses on macro policy aspects or foreign policy dynamics, without exploring how ACIA instruments are actually applied in the domestic microeconomic context.

The novelty of this research lies in its focus on analysing the stages of Indonesia's compliance, including output, outcome, and impact. As well as how this process contributes to policy transformation and MSME empowerment. By using the theoretical approach of Ronald B. Mitchell on compliance in international regimes (Gallo-Cajiao et al., 2023; Maf'ullilahi Zakinah et al., 2024). this study attempts to assess the effectiveness of ACIA as an instrument of people's economic development in Indonesia.

The selection of Indonesia's compliance variable with ACIA is based on the importance of ensuring that the country's involvement in international agreements is not only symbolic, but also

results in domestic policies that favour national interests (Karim, 2023; Wicaksana & and Karim, 2023) . In this context, Indonesia is required to show that its compliance with ACIA is not only normative, but also substantive, namely through real policies that are able to increase the capacity of MSMEs as a pillar of the national economy. The focus on this variable also reflects the importance of state transparency and accountability in managing the impact of economic liberalisation on strategic sectors in the country. Based on this background, this research aims to evaluate the extent to which Indonesia's compliance with the ACIA regime has an impact on the development of Indonesian MSMEs. This research is expected to make an academic contribution to the enrichment of international relations studies, particularly in the study of international regimes and global political economy. In addition, practically, the results of this research are expected to be a reference in formulating more inclusive investment policies, as well as supporting the creation of a resilient, independent, and competitive MSME ecosystem in regional and global markets.

METHOD

Research Design

This research uses a descriptive qualitative approach, which aims to describe and analyse Indonesia's compliance with the ACIA regime and its implications for the development of MSMEs. This approach was chosen because it is in line with the research objectives that focus on an in-depth understanding of socio-political phenomena and international policies in the context of international relations. This research is non-empirical and document-based, without involving primary data collection through interviews or surveys.

Participant

The participants in this study consisted of relevant actors involved in the formulation, implementation, and monitoring of investment and MSME policies in Indonesia. They include government officials (such as the Ministry of SMEs and BKPM), MSME actors, as well as experts or academics familiar with ACIA and the ASEAN investment regime. Data was obtained through documentation and literature review, rather than direct interviews due to the non-empirical nature of this research.

Population and the Methods of Sampling, Instrumentation

Data sources in this research consist of policy documents, laws and regulations, scientific journals, articles, and official reports relevant to the focus of the study. The sampling technique was purposive, which is the deliberate selection of data based on the relevance and relevance to the research objectives, which were developed based on the indicators of Ronald B. Mitchell's compliance theory (output, outcome, impact). Mitchell's compliance theory indicators (output, outcome, impact). Assessment was conducted using qualitative techniques in the form of content analysis, rather than quantitative scoring. Data validity was tested through source and method triangulation techniques.

Instrument

The main instrument in this study was a document analysis guideline developed based on Mitchell's theoretical framework. This instrument includes indicators: (1) output - the existence of formal regulations related to ACIA; (2) outcome - domestic policy adjustments; and (3) impact - real implications for MSMEs. This guideline is used to review the content of documents, policies, and secondary data.

Procedures and Time Frame

The research was conducted in several stages: (1) secondary data collection through literature study; (2) data screening and selection using relevance criteria; (3) document content analysis using a descriptive-qualitative approach; and (4) interpretation of results using international regime compliance theory. The research process was conducted for approximately 4 months, from January to April 2022.

Analysis Plan

Data were analysed using thematic content analysis method, through a process of condensation, presentation and inference. Findings were categorised based on the three main indicators of Mitchell's theory and compared with previous studies to identify consistency or differences in findings.

RESULTS AND DISCUSSION

Result

Based on data analysis, it was found that the respondents' feeding patterns were divided into three categories: good, sufficient, and inadequate. A total of 12 respondents (37.5%) had feeding patterns that were categorized as good, 10 respondents (31.3%) had sufficient patterns, and 10 other respondents (31.3%) showed inadequate feeding patterns. This shows that most mothers have implemented a diet that is classified as good, but the proportion of respondents with inadequate diets is also quite significant.

1. Feeding Pattern

Table 1. Frequency Distribution of Feeding Patterns at Posyandu Mandungan and Posyandu Perum GTS I in 2020

Feeding Pattern	n	%
Good	12	37.5%
Fair	10	31.3%
Poor	10	31.3%
Total	32	100%

Table 1 shows that. research at Piyungan Bantul Health Center in 2020 found that the pattern of good feeding was 12 respondents.

2. Stunting in Toddlers

Table 2. Distribution of Stunting Frequency in Toddlers at Mandungan Posyandu and Perum GTS I Posyandu in 2020 in 2020

Nutritional Status (Height-for-Age)	n	%
Normal	15	46.9%
Stunted (Short)	17	53.1%
Total	32	100%

Table 2 shows that research at the Piyungan Bantul Health Center in 2020 found that stunting in toddlers with short stature was 17 respondents (53.1%). The Relationship between Feeding Patterns and Stunting in Toddlers Table 3. The Relationship between Feeding Patterns and Stunting in Toddlers.

Table 3. The Relationship Between Feeding Patterns and Stunting Among Toddlers

Feeding Pattern	Normal (n, %)	Stunted (n, %)	Total (n)	p-value
Good	10 (83.3%)	2 (16.7%)	12	
Fair	4 (40.0%)	6 (60.0%)	10	
Poor	1 (10.0%)	9 (90.0%)	10	
Total	15	17	32	0.002

Table 3 shows that it is known that the pattern of feeding with normal stunting is 10 respondents (83.3%). While respondents with sufficient feeding patterns with stunting in toddlers are 6 respondents (60.0%), and insufficient feeding patterns with stunting in toddlers are 9 respondents (90.0). The results of statistical tests using the chi square test obtained research results with a p value = 0.002 (<0.05) indicating that feeding patterns have a significant relationship with stunting in toddlers.

Discussion

Regarding the nutritional status of children, it is known that of the 32 toddlers studied, 17 toddlers (53.1%) were classified as having stunting (short category), while the remaining 15 toddlers (46.9%) were classified as having normal height. These results indicate that more than half of the toddlers in this study experienced growth problems related to stunting. When analyzing the relationship between feeding patterns and the incidence of stunting, statistically significant results were obtained. In the group with good feeding patterns, most toddlers (83.3%) had normal nutritional status. Conversely, in the group with inadequate feeding patterns, the majority of toddlers (90%) experienced stunting. Likewise, in the group with sufficient feeding patterns, most toddlers (60%) also experienced stunting. The chi-square test showed a p value = 0.002 ($p < 0.05$), which indicates that there is a significant relationship between feeding patterns and the incidence of stunting in toddlers aged 1–5 years in the region. Thus, the findings of this study strengthen the hypothesis that the quality of feeding patterns plays a major role in determining the nutritional status and growth of children. The better the feeding pattern implemented by the mother, the lower the possibility of the child experiencing stunting.

The results of the study on feeding patterns in toddlers in the Piyungan Bantul Health Center work area showed that most respondents had a diet that was still not optimal. As many as 37.5% of respondents were categorized as having a good feeding pattern, while 31.3% were classified as sufficient and inadequate. This reflects that although there are groups of mothers who have implemented a diet according to nutritional guidelines, there is still a significant proportion who have not provided adequate food intake to their children. This condition indicates a need for increased nutrition education in the community, especially regarding the importance of frequency, variety, and nutritional content of toddler food (Simanjuntak et al., 2022; Yuliantini et al., 2023). An imbalance in diet can have a direct impact on children's growth and development (Hasrul et al., 2020; Jumiatusun, 2019).

In relation to growth status, it is known that more than half of the toddlers in this study experienced stunting. As many as 17 children (53.1%) were categorized as experiencing short growth or stunting, while 15 other children (46.9%) were classified as having normal height. This figure reflects that stunting is still a major nutritional problem in the Piyungan Health Center area. This incident can be caused by various factors, including inappropriate feeding practices from an early age. Therefore, it is important for health workers to actively monitor the growth and development of

toddlers through integrated health posts and provide assistance to families (Kurniawati & Santika, 2016; Nurhidayah et al., 2019; Putri & Dwihestie, 2020).

Analysis of the relationship between feeding patterns and stunting status in toddlers showed a significant relationship. In the group of mothers with good eating patterns, most children (83.3%) had normal nutritional status, while only 16.7% experienced stunting. Conversely, in the group with poor eating patterns, 90% of toddlers experienced stunting, and only 10% had normal nutritional status. Meanwhile, in the group with sufficient eating patterns, more than half (60%) experienced stunting. The results of the statistical test with chi-square produced a p value = 0.002, which showed that this relationship was statistically significant ($p < 0.05$). These findings emphasize the importance of good feeding practices in preventing stunting in children aged 1–5 years. Mothers who are able to arrange a diet according to their child's nutritional needs have been shown to be better able to maintain their child's growth status in the normal category. Meanwhile, irregular and low-quality eating patterns significantly increase the risk of stunting. Therefore, family-based interventions with a nutritional education approach need to be increased to reduce stunting rates. In addition, strengthening the role of integrated health posts in early detection and following up on cases of stunting in toddlers can be an effective strategy in efforts to improve community nutrition.

The results of this study contribute to strengthening the national nutrition intervention strategy, especially the B2SA program. The lack of diversity and quality of food at the family level indicates the need to involve Posyandu cadres in educating children about nutritious and affordable daily menus. These findings also emphasize the importance of optimizing nutrition education at Posyandu. Although focused on children aged 1–5 years, the results of this study remain relevant to support nutrition interventions in the 1000 HPK. Attention to child nutrition must continue into preschool through family-based monitoring and assistance to prevent further stunting.

CONCLUSIONS

Based on the results of the study conducted in the Piyungan Bantul Health Center work area, it can be concluded that toddler feeding patterns have a significant role in the nutritional status of children, especially the incidence of stunting. Good feeding patterns tend to be associated with normal nutritional status, while poor eating patterns are strongly correlated with increasing cases of stunting. Statistical analysis showed a significant relationship between feeding pattern variables and the incidence of stunting in toddlers aged 1–5 years ($p = 0.002$), which strengthens the finding that eating behavior at home is a major determinant factor in child growth. The implications of these results emphasize the importance of nutritional education for mothers and families as a preventive measure in overcoming stunting. Health interventions that focus on improving the quality of diet, monitoring growth regularly, and empowering the role of integrated health posts in providing nutritional counseling will greatly help reduce stunting rates. This study provides empirical data that can be used by health workers to design family and community-based intervention programs in efforts to overcome stunting sustainably. Further research is recommended using larger samples and a longitudinal approach to examine the long-term impact of diet on child growth.

AUTHOR'S CONTRIBUTION

The Author Contributions Statement can be up to several sentences long and should briefly describe the tasks of individual authors. Please list only 2 initials for each author, without full stops, but separated by commas (e.g. JC, JS). In the case of two authors with the same initials, please use

their middle initial to differentiate between them (e.g. REW, RSW). The Author Contributions Statement should be included at the end of the manuscript before the References.

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