

DETERMINANTS OF STUNTING INCIDENCE IN NORTH ACEH REGENCY IN 2025: THE ROLE OF CHRONIC ENERGY DEFICIENCY (CED) AMONG PREGNANT WOMEN AND UNDERNUTRITION IN CHILDREN UNDER FIVE

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Article history:

Received: June 2026

Revised: June 2026

Accepted: June 2026

ABSTRACT Stunting is a chronic nutritional disorder that has serious consequences for children's physical growth, cognitive development, and overall quality of life. This condition results from prolonged inadequate nutrient intake and recurrent infections, particularly during the first 1,000 days of life. This study employed a qualitative descriptive approach using purposive sampling. The participants consisted of policymakers and nutrition program implementers from the North Aceh District Health Office. The findings indicate that although the prevalence of stunting in North Aceh has declined, it remains relatively high and exceeds the threshold established by the World Health Organization (WHO). The major determinants identified include maternal nutritional status, particularly Chronic Energy Deficiency (CED), suboptimal breastfeeding practices, inadequate nutritional knowledge, and unequal access to healthcare services and sanitation. Furthermore, the findings reveal that children born to mothers with CED are at a greater risk of developing stunting due to impaired intrauterine growth. Recommended interventions include early identification of risk factors, strengthening maternal nutrition education, and enhancing nutrition-specific interventions implemented by the District Health Office. Stunting prevention and management should be carried out through comprehensive, integrated, and evidence-based strategies to effectively reduce its prevalence in line with national and global targets.

KEYWORDS: *Stunting determinants; Chronic Energy Deficiency (CED); Undernutrition among children under five; North Aceh; Maternal nutrition; Recurrent infections; Breastfeeding; Sanitation; Nutrition-specific interventions; District Health Office.*

1. INTRODUCTION

Stunting remains one of the most serious public health challenges in Indonesia and globally. It is characterized by chronic undernutrition and impaired linear growth resulting from prolonged inadequate nutrient intake and recurrent infections during the first 1,000 days of life. This condition not only affects children's physical growth but also compromises cognitive development, productivity, and overall quality of life in adulthood (Anwar et al., 2022).

Stunting refers to a condition in which children under five experience impaired linear growth, resulting in short stature due to long-term nutritional deficiencies in both the quantity and quality of nutrient intake (Fauziah, 2021). According to Presidential Regulation of the Republic of Indonesia No. 72 of 2021, stunting is defined as impaired growth and development caused by chronic malnutrition and recurrent infections, indicated by body length or height below the standards established by the Ministry of Health.

Numerous studies have demonstrated that the determinants of stunting are multifactorial, involving both direct and indirect causes. Direct determinants include maternal nutritional status before and during pregnancy, breastfeeding and complementary feeding practices, and maternal and child health conditions. Indirect determinants encompass socioeconomic status, access to safe drinking water, sanitation, and the quality of parent–child interactions (Ministry of Health of the Republic of Indonesia, 2019).

Batiro et al. (2017) reported that stunting is associated with several risk factors, including infectious diseases such as diarrhea and acute respiratory infections (ARI), delayed initiation of breastfeeding, incomplete immunization, inadequate food security, and unsafe water sources. Similarly, Ramayulis et al. (2018) emphasized that inappropriate breastfeeding practices and insufficient maternal knowledge regarding nutrition and health before, during, and after pregnancy contribute significantly to impaired child growth.

Stunting requires immediate and appropriate intervention to prevent its long-term consequences on human capital development. The short-term effects include delayed physical growth, impaired brain development, cognitive deficits, motor development disorders, metabolic disturbances, and suboptimal body size according to age. Long-term consequences include reduced intellectual capacity, poor academic achievement, diminished concentration during learning, lower educational performance, and decreased productivity in adulthood (Ministry of National Development Planning/Bappenas, 2018).

According to the World Health Organization (WHO), approximately 149 million children under five years of age worldwide, representing about 22% of the global under-five population, were affected by stunting in 2021. Regions with the highest prevalence include Sub-Saharan Africa

(36.8%) and South Asia (30.7%). At the country level, India reported a stunting prevalence of 30.9%, while Nigeria recorded 31.5%. In Southeast Asia, Timor-Leste had one of the highest prevalence rates globally at 46%. In contrast, Latin America and the Caribbean reported a substantially lower prevalence of approximately 11.3%.

According to the Indonesian Nutritional Status Survey (SSGI), the national prevalence of stunting declined from 24.4% in 2019 to 21.6% in 2021, representing a reduction of 2.8 percentage points over two years. Despite this improvement, stronger efforts remain necessary to achieve the national target of reducing stunting prevalence to 14% by 2024 and ultimately eliminating stunting by 2030 (Ministry of Health of the Republic of Indonesia, 2022). Riskesdas data further indicate that stunting is influenced not only by maternal and child malnutrition but also by maternal educational attainment, inadequate sanitation, and limited access to quality healthcare services.

Maidar (2022) reported that North Aceh Regency is not the district with the highest prevalence of stunting in Aceh Province. Nevertheless, the prevalence remained alarmingly high, decreasing only slightly from 38.8% in 2021 to 38.3% in 2022. This figure remains substantially above the WHO threshold of 20% for public health concern. Consequently, comprehensive prevention and management strategies are urgently needed, beginning with the early identification of the major determinants contributing to stunting.

The North Aceh District Health Office is responsible for improving the quality of health services aimed at reducing stunting prevalence. One of the primary strategies implemented is the provision of nutrition-specific interventions targeting vulnerable populations, particularly pregnant women and children under five years of age.

2. METHOD

2.1 Research Design

This study employed a qualitative descriptive research design to explore the determinants of stunting in North Aceh Regency. A qualitative approach was selected because it enables an in-depth understanding of the perspectives, experiences, and policy implementation related to stunting prevention and management. Rather than measuring statistical associations, this study sought to examine the underlying factors contributing to stunting from the viewpoints of policymakers and program implementers.

2.2 Study Setting

The research was conducted at the North Aceh District Health Office, Aceh Province, Indonesia. This institution is responsible for planning, implementing, monitoring, and evaluating

nutrition-specific interventions aimed at accelerating stunting reduction across the district.

2.3 Participants

Participants were selected using a purposive sampling technique, in which individuals were chosen based on their direct involvement in planning and implementing nutrition and maternal–child health programs. The study participants consisted of:

- a) Officials responsible for nutrition and maternal health programs at the North Aceh District Health Office;
- b) Nutrition program managers;
- c) Healthcare professionals directly involved in stunting prevention and intervention activities.

These participants were considered to possess comprehensive knowledge and experience regarding the implementation of stunting reduction programs within the district.

Table 1. Profile of Interview Informants

Informant	Total	Position	Educational Background
Head of the North Aceh District Health Office	3	1. Head of the North Aceh District Health Office	Master of Management
Person in Charge of the Family Health and Nutrition Program		2. Coordinator of the Family Health and Nutrition Program, North Aceh District Health Office	Master of Public Health
Chairperson of the Indonesian Midwives Association (IBI), North Aceh Branch		3. Chairperson of the Indonesian Midwives Association (IBI), North Aceh Branch	Master of Management

2.4 Data Collection

Primary data were collected through in-depth interviews using semi-structured interview guides. This method allowed participants to describe their experiences, perceptions, and challenges regarding the implementation of stunting prevention programs. To enhance data validity, the researchers also conducted document reviews of relevant government regulations, technical guidelines, policy documents, nutrition program reports, and other official publications related to stunting prevention. The interviews explored several key themes, including:

- a) determinants of stunting in North Aceh Regency;
- b) maternal nutritional status during pregnancy;
- c) Chronic Energy Deficiency (CED) among pregnant women;
- d) undernutrition among children under five;
- e) implementation of nutrition-specific interventions;
- f) barriers encountered in program implementation; and

g) strategies adopted to accelerate stunting reduction.

2.5 Data Analysis

Data were analyzed using qualitative descriptive analysis, following the stages proposed by Miles and Huberman, which include:

1. Data reduction, involving the selection, coding, and categorization of relevant information;
2. Data display, where findings were organized into thematic categories to facilitate interpretation; and
3. Conclusion drawing and verification, in which recurring themes and patterns were identified and validated throughout the analysis process.

The analysis focused on identifying the principal determinants contributing to stunting and examining how these factors influence the effectiveness of current prevention programs in North Aceh Regency.

To ensure the credibility and trustworthiness of the findings, the researchers employed source triangulation by comparing information obtained from different participants and supporting documents. This approach enhanced the validity of the interpretations and minimized potential bias. Furthermore, all interview findings were interpreted in accordance with existing literature, national policies, and international evidence regarding stunting prevention and maternal nutrition.

3. RESULT AND DISCUSSION

3.1 Result

a. Stunting Prevalence

The study involved key informants from the North Aceh District Health Office who were directly responsible for nutrition and maternal–child health programs. All participants had substantial experience in implementing nutrition interventions and monitoring stunting prevention activities. Their professional experience enabled them to provide comprehensive insights into the factors contributing to stunting as well as the challenges encountered during program implementation. The findings indicate that although the prevalence of stunting in North Aceh Regency has shown a gradual decline over recent years, the rate remains considerably higher than the threshold recommended by the World Health Organization (WHO). Consequently, stunting continues to represent a major public health concern requiring sustained multisectoral interventions. Participants emphasized that the reduction achieved thus far reflects improvements in nutrition-specific interventions. However, several structural and behavioral factors continue to hinder further progress.

The prevalence of stunting within the service area of the North Aceh District Health Office is presented in Table 2.

Table 2. Prevalence of Stunting in the Service Area of the North Aceh District Health Office, 2023

No.	Month	Number of Children Under Five Recorded in the E-PPGBM System	E-PPGBM Data Coverage (%)	Number of Stunted Children	Stunting Prevalence (%)
1	January	39,608	91	2,523	6.4
2	February	41,332	94	2,110	5.1
3	March	37,873	86	1,944	5.1
4	April	36,528	83	2,242	6.1
5	May	37,787	86	2,655	7.0
6	June	38,731	88	2,417	6.2
7	July	36,596	83	2,417	6.6
8	August	40,623	94	1,966	4.8
9	September	38,154	88	2,212	5.8
10	October	33,253	77	2,012	6.1

Source: E-PPGBM Database, North Aceh District Health Office (2023).

Based on Table 2, the highest number of children under five recorded in the Community-Based Nutrition Recording and Reporting System (E-PPGBM) was observed in February, with 41,332 children (94% reporting coverage). In contrast, the lowest reporting coverage occurred in October, with 33,253 children (77%) recorded.

The highest number of stunting cases was reported in May, with 2,655 children, corresponding to a stunting prevalence of 7.0%. Conversely, the lowest number of stunting cases was reported in March, with 1,944 children (5.1%).

Maternal Chronic Energy Deficiency (CED) as a Major Determinant

One of the most significant findings of this study is that Chronic Energy Deficiency (CED) among pregnant women remains a major determinant of stunting. Participants explained that mothers experiencing CED often fail to meet the nutritional requirements necessary for optimal fetal growth. As a result, infants are more likely to experience Intrauterine Growth Restriction (IUGR) and low birth weight, both of which substantially increase the risk of stunting during early childhood. According to the informants, inadequate maternal nutrition before conception and throughout pregnancy remains a persistent issue in several communities within North Aceh Regency. The distribution of pregnant women diagnosed with Chronic Energy Deficiency (CED) within the service area of the North Aceh District Health Office in 2023 is presented in Table 3.

Table 3. Distribution of Pregnant Women with Chronic Energy Deficiency (CED) by Community Health Center in the Service Area of the North Aceh District Health Office, 2023

No.	Community Health Center (Puskesmas)	Number of Pregnant Women with CED
1	Sawang	14
2	Nisam	21
3	Banda Baro	7
4	Kuta Makmur	28
5	Simpang Kramat	9
6	Syamtalira Bayu	17
7	Geureudong Pase	4
8	Meurah Mulia	21
9	Matangkuli	20
10	Paya Bakong	11
11	Pirak Timu	10
12	Cot Girek	7
13	Tanah Jambo Aye	43
14	Lhok Beuringen	5
15	Langkahan	14
16	Simpang Tiga	8
17	Seunudon	9
18	Blang	11
19	Baktiya	37
20	Baktiya Barat	72
21	Lhoksukon	16
22	Buket Hagu	11
23	Tanah Luas	21
24	Nibong	7
25	Samudera	14
26	Syamtalira Aron	57
27	Tanah Pasir	7
28	Lapang	31
29	Muara Batu	41
30	Dewantara	57
31	Babah Buloh	81
32	Nisam Antara	27
Total		454

Source: North Aceh District Health Office (2023).

As shown in Table 3, a total of 454 pregnant women were identified as experiencing Chronic Energy Deficiency (CED) in 2023. The highest number of CED cases was reported at Babah Buloh Community Health Center, with 81 cases, followed by Baktiya Barat (72 cases). The lowest number of cases was recorded at Geureudong Pase Community Health Center, with four cases.

b. Undernutrition Among Children Under Five

Another important determinant identified in this study is undernutrition among children under five years of age. Participants reported that many children continue to consume diets that fail to meet their daily nutritional requirements, particularly regarding protein, vitamins, and essential minerals. Inadequate complementary feeding practices, low dietary diversity, and irregular growth monitoring

were frequently cited as contributing factors. These nutritional deficiencies adversely affect children's physical growth and increase their susceptibility to infectious diseases, thereby further elevating the risk of stunting. The number of undernourished children under five in the service area of the North Aceh District Health Office in 2023 is presented in Table 4.

Table 4. Distribution of Undernourished Children Under Five by Community Health Center in the Service Area of the North Aceh District Health Office, 2023

No.	Community Health Center (Puskesmas)	Number of Undernourished Children
1	Sawang	32
2	Nisam	141
3	Banda Baro	4
4	Kuta Makmur	85
5	Simpang Kramat	34
6	Syamtalira Bayu	8
7	Geureudong Pase	25
8	Meurah Mulia	89
9	Matangkuli	91
10	Paya Bakong	136
11	Pirak Timu	57
12	Cot Girek	8
13	Tanah Jambo Aye	50
14	Lhok Beuringen	57
15	Langkahan	2
16	Simpang Tiga	20
17	Seunudon	56
18	Blang	16
19	Baktiya	51
20	Baktiya Barat	56
21	Lhoksukon	57
22	Buket Hagu	117
23	Tanah Luas	50
24	Nibong	22
25	Samudera	40
26	Syamtalira Aron	57
27	Tanah Pasir	7
28	Lapang	31
29	Muara Batu	41
30	Dewantara	57
31	Babah Buloh	81
32	Nisam Antara	27
Total		1,607

Source: North Aceh District Health Office (2023).

As presented in Table 4, a total of 1,607 children under five were identified as undernourished in 2023. The highest number of undernourished children was recorded at Nisam Community Health Center, with 141 cases, followed by Paya Bakong (136 cases) and Buket Hagu (117 cases). In contrast, the lowest number of cases was reported at Langkahan Community Health Center, with two cases.

The distribution of undernutrition varied considerably across community health centers, indicating disparities in nutritional status among children under five within the North Aceh District. These findings suggest that targeted nutrition interventions should prioritize health centers with the highest burden of undernutrition to reduce the risk of stunting and improve child health outcomes

3.2 Discussion

a. Stunting Prevalence

Table 2 demonstrates that the highest number of stunting cases was recorded in May, with 2,655 children (7.0%), whereas the lowest number occurred in March, with 1,944 children (5.1%). These findings indicate monthly fluctuations in stunting prevalence across community health centers within the jurisdiction of the North Aceh District Health Office. Despite these variations, the overall prevalence of stunting in North Aceh remains above the 20% threshold established by the World Health Organization (WHO) as a public health concern, consistent with the situation observed across other districts in Aceh Province (Maidar, 2022).

The observed fluctuations suggest that stunting prevalence does not follow a consistent linear trend. Instead, the variations may reflect the influence of seasonal factors, differences in the implementation and effectiveness of nutrition intervention programs, and variations in the coverage of community-based health services, particularly those provided through Posyandu (Integrated Health Posts).

The coverage of data reporting through the Electronic Community-Based Nutrition Recording and Reporting System (E-PPGBM) also appears to influence the estimation of stunting prevalence. For example, although reporting coverage reached 94% in August, the recorded prevalence of stunting was relatively low (4.8%). Conversely, reporting coverage declined to 77% in October, while the prevalence increased to 6.1%. These findings suggest that reporting coverage alone cannot explain fluctuations in stunting prevalence and that additional environmental, socioeconomic, and health-related factors should be investigated in future studies.

According to UNICEF (2020), stunting is primarily caused by inadequate dietary intake, recurrent infectious diseases, and insufficient psychosocial stimulation during early childhood. In the context of North Aceh, these determinants require further investigation to ensure that stunting prevention strategies adopt a comprehensive, multisectoral, and sustainable approach (Maidar, 2022). Geographical conditions, particularly in remote inland and coastal communities, may limit access to adequate nutrition and healthcare services. Furthermore, household economic status, childcare practices, and environmental sanitation are likely to contribute to the persistently high burden of stunting.

Continuous growth monitoring and consistent nutrition surveillance are therefore essential, particularly during periods when an increasing trend in stunting prevalence is observed. Local governments should strengthen existing interventions by expanding supplementary feeding programs based on locally available foods, enhancing the capacity of Posyandu volunteers, and promoting integrated cross-sector collaboration to improve maternal and child nutrition.

b. Chronic Energy Deficiency (CED) Among Pregnant Women

The findings presented in Table 3 indicate that 454 pregnant women were identified as experiencing Chronic Energy Deficiency (CED) within the North Aceh District Health Office service area in 2023. This finding highlights that chronic maternal undernutrition remains a major public health challenge requiring immediate attention. The distribution of CED cases varied considerably among community health centers. The highest numbers were reported in Babah Buloh (81 cases), Baktiya Barat (72 cases), Syamtalira Aron (57 cases), Dewantara (57 cases), and Tanah Jambo Aye (43 cases). In contrast, Geureudong Pase (4 cases) and Lhok Beuringen (5 cases) reported substantially fewer cases. These geographical disparities may reflect differences in socioeconomic conditions, accessibility to healthcare services, nutrition education, and local environmental characteristics.

Maternal CED is widely recognized as one of the principal risk factors for childhood stunting. Pregnant women with poor nutritional status are more likely to deliver infants with low birth weight (LBW), shorter birth length, and impaired fetal growth, all of which increase the likelihood of subsequent stunting. UNICEF (2020) identifies maternal undernutrition as a direct determinant of stunting because inadequate maternal energy and nutrient intake compromises fetal growth and development throughout pregnancy.

Empirical evidence supporting this relationship has been reported by Setyorini et al. (2023), who found a significant association between maternal CED and stunting among children aged 6–23 months in Karawang, Indonesia. Their study demonstrated that children born to mothers with CED were approximately twice as likely to experience growth failure compared with children whose mothers had normal nutritional status. Similarly, Nubli and Sutarto (2023) reported that maternal CED was significantly associated with stunting among children aged 24–59 months. Chronic maternal undernutrition contributes to intrauterine growth restriction, resulting in low birth weight, reduced birth length, and an increased risk of impaired linear growth during childhood.

The World Health Organization (WHO, 2014) emphasizes that improving maternal nutritional status before conception and throughout pregnancy constitutes one of the most effective strategies for reducing stunting worldwide. In line with this recommendation, the Indonesian Ministry of Health

(2023) recommends that pregnant women diagnosed with CED receive macronutrient supplementation for at least 120 consecutive days to improve maternal nutritional status. In North Aceh, supplementary feeding programs are implemented through coordinated efforts involving community health centers (Puskesmas), Posyandu, healthcare facilities, and home visits. Pregnant women receive locally produced supplementary foods once each week, accompanied by nutrition education promoting healthy dietary practices. The composition of these supplementary foods follows the national technical guidelines for locally based supplementary feeding, ensuring adequate energy, protein, and essential micronutrient intake during pregnancy.

c. Undernutrition Among Children Under Five

As presented in Table 4, a total of 1,607 children under five were identified as undernourished within the North Aceh District Health Office service area in 2023. The highest numbers of undernourished children were reported by Nisam (141 cases), Paya Bakong (136 cases), Buket Hagu (117 cases), Matangkuli (91 cases), and Meurah Mulia (89 cases). Conversely, the lowest numbers were recorded in Langkahan (2 cases), Tanah Pasir (7 cases), and both Cot Girek and Syamtalira Bayu (8 cases each).

The marked geographical variation in undernutrition suggests substantial differences in household socioeconomic status, dietary practices, sanitation, healthcare accessibility, and maternal knowledge regarding Infant and Young Child Feeding (IYCF) practices. The five community health centers with the highest burden accounted for 574 cases (32.2%) of all undernourished children in North Aceh, indicating priority areas for targeted nutrition interventions. In contrast, the five centers reporting the fewest cases contributed only 29 cases (1.6%), warranting further investigation to determine whether these lower figures reflect successful nutrition programs, higher Posyandu coverage, or more favorable dietary patterns.

Overall, 13 of the 32 community health centers (40.6%) reported more than 50 cases of undernutrition, indicating that child undernutrition represents a district-wide public health problem rather than isolated local outbreaks. When considered alongside the monthly stunting prevalence reported in Table 2 (4.8%–7.0%), these findings suggest that areas with high levels of child undernutrition are likely to experience an increased burden of stunting in the future, given that undernutrition is a well-established immediate determinant of impaired linear growth.

UNICEF (2020), through its Conceptual Framework of Malnutrition, identifies both acute and chronic undernutrition as direct causes of stunting. Children who fail to receive adequate energy, protein, and essential micronutrients experience impaired linear growth and developmental delays. Likewise, the World Health Organization (2014) explains that chronic deficiencies of energy and

protein during early childhood disrupt bone development and endocrine function, thereby limiting height gain. The Indonesian Ministry of Health (2018) further states that deficiencies of both macronutrients and micronutrients during the first years of life directly contribute to growth failure because the body lacks sufficient nutrients to support optimal development.

Undernutrition during early childhood therefore represents one of the most important determinants of stunting and has long-term consequences for children's health, cognitive development, educational attainment, and future productivity. Addressing child undernutrition requires comprehensive interventions integrating nutrition, healthcare, and social protection programs. According to the Indonesian Ministry of Health (2021), undernourished children require timely provision of additional energy and essential macro- and micronutrients through Supplementary Feeding Programs (PMT) implemented by both government and community initiatives. These supplementary foods should provide adequate energy, protein, iron, zinc, vitamin A, and other essential nutrients to support catch-up growth.

Limited parental knowledge, particularly among mothers, regarding balanced diets and appropriate complementary feeding practices remains a major contributor to child undernutrition. Consequently, strengthening education on Infant and Young Child Feeding (IYCF), including age-appropriate feeding practices and the utilization of diverse locally available nutritious foods, is essential (Abdillah et al., 2020). Furthermore, the World Bank (2017) emphasizes that improvements in child nutrition cannot be achieved solely through the health sector. Sustainable reductions in undernutrition require coordinated multisectoral collaboration involving education, food security, social protection, agriculture, and community empowerment programs. Interventions such as food assistance, family social protection schemes, and nutrition-sensitive development programs should therefore be strengthened to address the underlying determinants of child malnutrition and stunting.

Informants consistently emphasized that limited maternal knowledge regarding nutrition, breastfeeding, and complementary feeding contributes significantly to stunting. Many mothers were reported to have insufficient understanding of:

- a) Balanced nutrition during pregnancy;
- b) Exclusive breastfeeding;
- c) Appropriate timing for introducing complementary foods;
- d) Dietary diversity; and
- e) Child growth monitoring.

Consequently, inappropriate infant feeding practices continue to occur despite the availability of health services.

d. Limited Access to Sanitation and Healthcare Services

The study also identified environmental factors as important contributors to stunting. Several participants highlighted that inadequate sanitation, unsafe drinking water, and limited access to quality healthcare services increase children's exposure to recurrent infections such as diarrhea. Frequent infections reduce nutrient absorption and impair children's growth, thereby increasing the likelihood of chronic malnutrition.

e. Existing Government Interventions

The North Aceh District Health Office has implemented various nutrition-specific interventions aimed at reducing stunting prevalence. These interventions include:

- a) Nutritional screening for pregnant women;
- b) Provision of supplementary foods for pregnant women with chronic energy deficiency;
- c) Iron and folic acid supplementation;
- d) Promotion of exclusive breastfeeding;
- e) Growth monitoring through integrated health posts (posyandu);
- f) Nutrition education and counseling;
- g) Supplementary feeding programs for undernourished children; and
- h) Collaboration with multiple sectors to improve sanitation and environmental health.

Participants acknowledged that these interventions have contributed to the gradual reduction in stunting prevalence. However, they emphasized that greater community participation and stronger cross-sector collaboration are required to achieve sustainable improvements.

4. CONCLUSION

The findings of this study indicate that stunting remains a significant public health concern in North Aceh Regency despite ongoing nutrition intervention programs. Three major conclusions can be drawn from the study.

1. The prevalence of stunting fluctuated throughout 2023 across the service area of the North Aceh District Health Office. Monthly variations were observed in accordance with the number of children under five recorded in the Electronic Community-Based Nutrition Recording and Reporting System (E-PPGBM). These fluctuations suggest that, in addition to reporting coverage, seasonal, environmental, and programmatic factors may also influence the observed prevalence of stunting.
2. Chronic Energy Deficiency (CED) among pregnant women is a major determinant of childhood stunting. Maternal undernutrition substantially increases the risk of adverse birth outcomes,

including low birth weight, reduced birth length, and impaired fetal growth, all of which contribute to an increased likelihood of stunting during early childhood. These findings reinforce existing evidence highlighting the importance of improving maternal nutritional status before and throughout pregnancy.

3. Undernutrition among children under five remains highly prevalent and unevenly distributed across community health centers, indicating that child malnutrition is a systemic rather than an isolated public health problem. The high burden of undernutrition directly contributes to the persistence of stunting and underscores the need for comprehensive nutrition interventions targeting vulnerable populations.

Recommendations

Based on the findings of this study, several recommendations are proposed to strengthen stunting prevention efforts in North Aceh Regency.

1. The consistency and quality of data entry into the Electronic Community-Based Nutrition Recording and Reporting System (E-PPGBM) should be improved to ensure more accurate estimation of stunting prevalence. Regular refresher training, supportive supervision, and continuous monitoring should be provided for nutrition officers and community health volunteers (Posyandu cadres) across all community health centers within the North Aceh District Health Office.
2. The coverage and continuity of nutrition intervention programs for pregnant women with Chronic Energy Deficiency (CED) should be strengthened, particularly in areas reporting a high burden of cases. Locally based supplementary feeding programs should be expanded through efficient distribution systems, routine monitoring, and nutrition education to improve maternal nutritional status before and during pregnancy.
3. Addressing undernutrition among children under five requires a holistic, integrated, and sustainable multisectoral approach. Effective interventions should involve collaboration among families, communities, healthcare providers, educational institutions, agriculture, food security programs, and social protection sectors. Strengthening community participation and cross-sector partnerships will be essential for improving child nutritional status and achieving sustainable reductions in stunting prevalence.

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