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Epidemiological Study of Wasting Among Children Under Five in Coastal Areas: An Analysis of Food Security and Dietary Quality

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Abstract: Coastal regions are typically associated with abundant access to animal protein; however, empirical data reveal a high prevalence of wasting in these areas, presenting a coastal nutritional paradox. Despite being the urban center of West Nusa Tenggara, Mataram City faces a significant burden of wasting, particularly within its coastal communities. This study aimed to analyze the association between household food security, dietary patterns, and the incidence of wasting. A cross-sectional study was conducted in Mataram City from February to September 2024, involving 155 children aged 12–59 months selected via total sampling. Food security was assessed using the Household Food Insecurity Access Scale (HFIAS), while dietary patterns were evaluated using a Semi-Quantitative Food Frequency Questionnaire (SQ-FFQ). Nutritional status was determined via anthropometric measurements (weight-for-height). The results indicated an alarming prevalence of wasting (49.7%) and severe wasting (20.0%). Although 52.3% of households experienced moderate food insecurity, statistical analysis revealed no significant association between household food security and wasting (p=0.659). Conversely, dietary patterns were significantly associated with wasting (p=0.003). This study highlights a paradox wherein household food access does not guarantee optimal child nutritional status. The primary driver of wasting in this coastal population appears to be poor dietary quality and insufficient protein intake rather than mere food availability. Future interventions must shift from generalized food aid to targeted nutritional education focusing on dietary diversity.

Keywords: Children under five, Coastal health, Dietary patterns, Food security, Wasting.

1. INTRODUCTION

Acute malnutrition, or wasting (low weight-for-height), constitutes a critical global health emergency that significantly impedes the attainment of the Sustainable Development Goals (SDGs), particularly Target 2.2 regarding the eradication of all forms of malnutrition. Distinct from stunting, which reflects chronic deficiency and long-term developmental impact, wasting is a manifestation of acute nutritional deficit carrying immediate mortality risks. Empirical evidence indicates that wasting amplifies the risk of mortality in children under five by 11.6 times compared to well-nourished children, primarily due to a drastic compromise in immune function (Olofin et al., 2013). Globally, the 2023 Joint Child Malnutrition Estimates report that 45 million children under five (6.8%) suffer from wasting, with Southeast Asia bearing one of the heaviest burdens worldwide (UNICEF/WHO/World Bank Group, 2023).

In Indonesia, the ongoing epidemiological transition has precipitated a double burden of malnutrition. While the current national health discourse is predominantly fixated on stunting reduction, the trend of wasting exhibits a concerning resurgence. Data from the 2023 Indonesian Health Survey (SKI) reveals that the national prevalence of wasting rose to 8.5%, up from 7.7% in the previous year (Kemenkes RI, 2024). This figure significantly exceeds the

2024 National Medium-Term Development Plan (RPJMN) target of 7% and remains well above the World Health Organization's (WHO) alert threshold of <5%. This upward trajectory suggests that existing nutritional interventions may be insufficient in addressing acute growth failure, or that there are shifting determinants that remain undetected.

A specific, contradictory epidemiological phenomenon is observed in Mataram City, West Nusa Tenggara. Despite being an urban economic and administrative hub with superior access to healthcare services compared to rural regions, Mataram City records a wasting prevalence of 9.6%, surpassing the national average (Kemenkes RI, 2024). More specifically, the highest caseloads are concentrated in coastal zones. This reality presents a Coastal Nutritional Paradox. Theoretically, coastal regions possess a comparative advantage in access to animal protein sources, a premise supported by Ministry of Marine Affairs and Fisheries data (2023) showing high national Fish Consumption Rates (56.48 kg/capita/year). However, this abundance of natural resources does not appear to convert linearly into optimal nutritional status for local children (KKP, 2024).

The UNICEF conceptual framework identifies household food security defined as physical and economic access to food as a primary underlying cause of nutritional status. However, empirical realities in coastal communities often defy these theoretical expectations, resulting in perplexing inconsistencies. While some studies establish a strong positive correlation between food security and nutritional status (Christina et al., 2025; Safkaur et al., 2025), others report no significant association (Dasril et al., 2024; Hartina et al., 2020). This discordance in findings suggests the presence of mediating factors distorting the relationship. In impoverished fishing communities, an economic substitution phenomenon is hypothesized, wherein high-value nutrient-rich catch is commodified to purchase inexpensive, energy-dense but nutrient-poor staples. This mechanism potentially fosters hidden hunger (Yamin et al., 2025).

This research is critical to bridging the knowledge gap regarding the determinants of wasting in specific, often-neglected urban-coastal settings. The study aims to analyze the association between household food security, dietary patterns, and the incidence of wasting. A profound understanding of these dynamics is essential for reorienting public health policy, shifting from generalized, quantity-based food aid (focusing on carbohydrates) toward interventions that prioritize dietary quality, food diversification, and family nutritional literacy.

2. METHODS

This study employed an analytic observational design with a cross-sectional approach to evaluate correlations between independent and dependent variables at a single point in time.

The research was conducted in Mataram City, West Nusa Tenggara, from February to September 2024. The study population comprised all children aged 12–59 months registered at the Integrated Healthcare Center (Posyandu) within the working area of the Tanjung Karang Primary Healthcare Center. To minimize selection bias, a total sampling technique was utilized. The inclusion criteria were: (1) children with permanent domicile in the study area, (2) absence of severe chronic conditions affecting anthropometry (e.g., hydrocephalus), and (3) obtained parental informed consent. A total of 155 children met these criteria and were included in the final analysis.

Measured using the Household Food Insecurity Access Scale (HFIAS), a globally standardized instrument developed by FANTA/USAID. This tool assesses anxiety and experiences of food deprivation over the preceding four weeks. Based on the scores, households were stratified into four categories: Food Secure, Mildly Food Insecure, Moderately Food Insecure, and Severely Food Insecure. Assessed using a Semi-Quantitative Food Frequency Questionnaire (SQ-FFQ) to evaluate the frequency and quality of intake (energy sources, bodybuilding foods, and regulatory foods). Dietary quality scores were categorized into four levels: Good (≥80%), Adequate (70–79%), Moderate (60–69%), and Deficit (<60%). Data were analyzed using the Chi-Square test to determine the statistical significance of associations between the independent variables (food security and dietary patterns) and the dependent variable (nutritional status).

3. RESULTS AND DISCUSSION

a. Sociodemographic Characteristics

The majority of parents belonged to the young productive age group (18–29 years), accounting for 52.9% of the sample. regarding educational attainment, the respondents were predominantly Junior High School graduates (40.6%). Furthermore, 51.0% of mothers were not formally employed. The detailed sociodemographic characteristics of the respondents are presented in Table 1.

Table 1. Frequency Distribution of Respondent Characteristics (n=155)

Characteristics	Frequency (n)	Percentage (%)
Parental Age		
18 – 29 Years	82	52.9
30 – 39 Years	48	31.0
40 – 50 Years	25	16.1
Educational Attainment		
No Formal Education	3	1.9
Primary School (*SD*)	45	29.0
Junior High School (*SMP*)	63	40.6
Senior High School (*SMA*)	34	21.9

Higher Education	10	6.5
Occupational Status		
Unemployed / Homemaker	79	51.0
Laborer	17	11.0
Fisherman	12	7.7
Trader / Merchant	36	23.2
Entrepreneur	8	5.2
Civil Servant / Contract Staff	3	1.9

As detailed in Table 1, the respondent profile is characterized predominantly by lower-to-middle educational and socioeconomic backgrounds. This demographic pattern potentially compromises household purchasing power regarding high-quality nutritious food.

b. Bivariate Analysis

The study revealed a critical nutritional profile among the subjects, with the prevalence of wasting reaching 49.7% and severe wasting at 20.0%. Regarding food access, the majority of households (52.3%) were classified as moderately food insecure. The statistical associations between household food security, dietary patterns, and wasting status are summarized in Table 2.

Table 2. Association between Household Food Security, Dietary Patterns, and Wasting Status (n=155)

Variables	Severely Wasted n (%)	Wasted n (%)	Normal n (%)	Overweight n (%)	p-value[a]
Food Security (HFIAS)					**0.659**
Food Secure	1 (16.7)	5 (83.3)	0 (0.0)	0 (0.0)	
Mildly Insecure	6 (15.0)	23 (57.5)	8 (20.0)	3 (7.5)	
Moderately Insecure	18 (22.2)	37 (45.7)	14 (17.3)	12 (14.8)	
Severely Insecure	6 (21.4)	12 (42.9)	5 (17.9)	5 (17.9)	
Dietary Patterns (SQ-FFQ)					**0.003***
Good (>80%)	6 (21.4)	12 (42.9)	4 (14.3)	6 (21.4)	
Adequate (70–79%)	3 (18.8)	2 (12.5)	7 (43.8)	4 (25.0)	
Moderate (60–69%)	10 (14.9)	44 (65.7)	10 (14.9)	3 (4.5)	
Deficit (<60%)	12 (27.3)	19 (43.2)	6 (13.6)	7 (15.9)	

The statistical analysis revealed no significant correlation between household food security and the incidence of wasting (p=0.659). This finding aligns with prior studies indicating that household-level food access does not invariably translate to acute nutritional status in children (Hartina et al., 2020; Sihotang & Rumida, 2020). The absence of an association suggests a fundamental disconnect between aggregate household food availability and actual individual intake. This discrepancy can be attributed to the nature of the HFIAS instrument, which primarily captures the perception of anxiety and general

household accessibility but lacks sensitivity in detecting the specific quantity and quality of food allocated to the child (FAO, 2016). Consequently, households with low food security scores do not necessarily have wasted children if internal coping strategies are effective.

This phenomenon is best elucidated through the mechanism of Maternal Buffering. In many developing contexts, mothers frequently prioritize child feeding by compromising their own intake (Choudhury et al., 2019; Terfa et al., 2022). As a result, while the household HFIAS score may reflect insecurity (driven by maternal anxiety), the child's basic caloric requirements remain protected (Asma & Kotani, 2023).

Conversely, dietary patterns emerged as a significantly stronger predictor of wasting ($p=0.003$). These results are consistent with recent literature emphasizing dietary quality as a direct determinant of nutritional status (Putri et al., 2024; Triveni, 2025). This finding strongly corroborates the Protein Leverage Hypothesis, which posits that organisms regulate intake primarily to meet protein targets; however, in diets dominated by low-protein carbohydrates, children may experience failure in lean mass accretion despite sufficient caloric intake (Zulfiana et al., 2024). Deficiency in animal protein essential for muscle tissue synthesis and linear growth appears to be a key driver of wasting in the study area (Headey et al., 2018).

Further analysis highlights the phenomenon of Hidden Hunger, characterized by a gap between energy intake and nutrient density. Low animal protein intake is exacerbated by the high consumption of nutrient-poor, ultra-processed snacks. These foods often exert a displacement effect on main meals, inducing satiety without providing essential nutrients. Consequently, children are trapped in a state of being calorically full but nutrient starved, manifesting as low weight-for-height (Green et al., 2019; Pries et al., 2019).

A distinct nutritional irony is evident within this coastal setting. Despite physical proximity to marine resources, access to fish is not linearly converted into household consumption due to economic factors. High-value catches are frequently prioritized for sale to generate cash income rather than for domestic consumption (Thilsted et al., 2016). Paradoxically, this income is often diverted toward purchasing inexpensive, convenient, yet nutrient-poor foods such as instant noodles or biscuits providing children with only empty calories (Johnsson et al., 2025). This dynamic confirms that interventions to combat wasting cannot rely solely on increasing food production, they must also target nutritional

literacy and household economic management to disrupt the cycle of non-nutritious consumption (Golden et al., 2021).

4. CONCLUSION

The burden of wasting in the coastal regions of Mataram City has reached a critical threshold. This study establishes that the primary determinant of this nutritional deficit is not the lack of household food availability, but rather the sub-optimal quality of dietary intake among children under five. The findings underscore the existence of a protective buffering mechanism that shields children from caloric deficits even within food-insecure households; however, this protection fails to ensure adequate nutrient density. Consequently, public health interventions must pivot from generalized food assistance to targeted nutritional education emphasizing dietary diversification and the prioritization of animal protein intake to effectively mitigate the risk of acute malnutrition.

REFERENCES

Asma, K. M., & Kotani, K. (2023). Intrahousehold Food Intake Inequality by Family Roles and Age Groups. *Nutrients*, *15*(9), 2126. https://doi.org/10.3390/nu15092126

Choudhury, S., Headey, D., & Masters, W. A. (2019). *First Foods: Diet Quality Among Infants Aged 6–23 Months in 42 Countries* (SSRN Scholarly Paper No. 3263020). Social Science Research Network. https://doi.org/10.2139/ssrn.3263020

Christina, G., Bolang, A. S. L., & Kawengian, S. E. S. (2025). Hubungan antara Ketahanan Pangan Keluarga dengan Status Gizi pada Anak SD Negeri 72 Kota Manado. *Medical Scope Journal*, *8*(1), 31–36. https://doi.org/10.35790/msj.v8i1.61407

Dasril, O., Destri, V., Zaimy, S., Idaman, M., & Moryanda, R. (2024). Hubungan Ketersediaan Pangan Tingkat Rumah Tangga Dan Pengetahuan Terhadap Status Gizi Remaja Putri Di Sma N 4 Padang. *Jurnal Kesehatan Saintika Meditory*, *7*(1), 513–521. https://doi.org/10.30633/jsm.v7i1.2726

FAO. (2016). *Methods for estimating comparable prevalence rates of food insecurity experienced by adults throughout the world. Voices of the Hungry. Technical report—Number 1/August 2016 (Revised Version)*. FAO. https://openknowledge.fao.org/handle/20.500.14283/i4830e

Golden, C. D., Koehn, J. Z., Shepon, A., Passarelli, S., Free, C. M., Viana, D. F., Matthey, H., Eurich, J. G., Gephart, J. A., Fluet-Chouinard, E., Nyboer, E. A., Lynch, A. J., Kjellevold, M., Bromage, S., Charlebois, P., Barange, M., Vannuccini, S., Cao, L., Kleisner, K. M., … Thilsted, S. H. (2021). Aquatic foods to nourish nations. *Nature*, *598*(7880), 315–320. https://doi.org/10.1038/s41586-021-03917-1

Green, M., Hadihardjono, D. N., Pries, A. M., Izwardy, D., Zehner, E., & Huffman, S. L. (2019). High proportions of children under 3 years of age consume commercially produced snack foods and sugar-sweetened beverages in Bandung City, Indonesia. *Maternal & Child Nutrition*, *15*(Suppl 4), e12764. https://doi.org/10.1111/mcn.12764

Hartina, Laenggeng, A. H., & Nurjanah. (2020). Hubungan Pola Makan dan Ketersediaan Pangan Rumah Tangga dengan Status Gizi Remaja di Huntara Asam III Kec. Ulujadi Kota Palu: *Jurnal Kolaboratif Sains*, *3*(4), 203–209. https://doi.org/10.56338/jks.v3i4.1714

Headey, D., Hirvonen, K., & Hoddinott, J. (2018). Animal Sourced Foods and Child Stunting. *American Journal of Agricultural Economics*, *100*(5), 1302–1319. https://doi.org/10.1093/ajae/aay053

Johnsson, E., Harris, C., & Drewnowski, A. (2025). Nutrient density and affordability of aquatic foods in the FAO uFISH database assessed using Nutrient Rich Food (NRF) indices. *Frontiers in Nutrition*, *12*, 1675142. https://doi.org/10.3389/fnut.2025.1675142

Kemenkes RI. (2024). *LAPORAN SKI 2023 DALAM ANGKA*. https://drive.google.com/file/d/1rjNDG_f8xG6-Y9wmhJUnXhJ-vUFevVJC/view?usp=sharing&usp=embed_facebook

KKP. (2024). *Laporan Kinerja Kementerian Kelautan dan Perikanan, 2023*.

Olofin, I., McDonald, C. M., Ezzati, M., Flaxman, S., Black, R. E., Fawzi, W. W., Caulfield, L. E., Danaei, G., & Nutrition Impact Model Study (anthropometry cohort pooling). (2013). Associations of suboptimal growth with all-cause and cause-specific mortality in children under five years: A pooled analysis of ten prospective studies. *PloS One*, *8*(5), e64636. https://doi.org/10.1371/journal.pone.0064636

Pries, A. M., Sharma, N., Upadhyay, A., Rehman, A. M., Filteau, S., & Ferguson, E. L. (2019). Energy intake from unhealthy snack food/beverage among 12-23-month-old children in urban Nepal. *Maternal & Child Nutrition*, *15*(Suppl 4), e12775. https://doi.org/10.1111/mcn.12775

Putri, H. A., Simanjuntak, B. Y., & Suryani, D. (2024). Hubungan pola pemberian makan dengan kejadian wasting pada anak balita usia 1-5 tahun di Puskesmas Penurunan Kota Bengkulu. *Nutrition and Health Insights*, *1*(2), 65–70.

Safkaur, T. C. P. W., Sanggelorang, Y., & Musa, E. C. (2025). Hubungan ketahanan pangan rumah tangga dengan status gizi pada balita. *Holistik Jurnal Kesehatan*, *19*(6), 1664–1672. https://doi.org/10.33024/hjk.v19i6.1197

Sihotang, U., & Rumida, R. (2020). Hubungan Ketahanan Pangan Dan Mutu Gizi Konsumsi Pangan (Mgp4) Keluarga Dengan Status Gizi Balita Di Desa Palu Sibaji Kecamatan Pantai Labu. *Wahana Inovasi : Jurnal Penelitian Dan Pengabdian Masyarakat UISU*, *9*(2), 50–59.

Terfa, Z. G., Nantanda, R., Lesosky, M., Devereux, G., Obasi, A., Mortimer, K., Khan, J., Rylance, J., & Niessen, L. W. (2022). Household food insecurity, maternal nutrition, environmental risks and infants' health outcomes: Protocol of the IMPALA birth cohort study in Uganda. *BMJ Open*, *12*(3), e050729. https://doi.org/10.1136/bmjopen-2021-050729

Thilsted, S. H., Thorne-Lyman, A., Webb, P., Bogard, J. R., Subasinghe, R., Phillips, M. J., & Allison, E. H. (2016). Sustaining healthy diets: The role of capture fisheries and aquaculture for improving nutrition in the post-2015 era. *Food Policy*, *61*, 126–131. https://doi.org/10.1016/j.foodpol.2016.02.005

Triveni. (2025). Keberagaman Makanan Terhadap Kejadian Wasting Pada Bayi Usia 0-59 Bulan di Kota Bukittinggi. *Bunda Edu-Midwifery Journal (BEMJ)*, *8*(2), 713–719. https://doi.org/10.54100/bemj.v8i2.549

UNICEF/WHO/World Bank Group. (2023). *Levels and Trends in Child Malnutrition*. UNICEF/WHO/World Bank Group.

Yamin, I. S., Sulistiawati, F., & Hardianti, M. (2025). The Relationship Between Gadget Usage Habits, Parenting Stayles And Eating Patterns Of Children Aged 4-7 Years With The Nutritional Status. *PROFESSIONAL HEALTH JOURNAL*, *6*(2), 492–498. https://doi.org/10.54832/phj.v6i2.889

Zulfiana, Y., Fatmawati, N., & Pratiwi, Y. S. (2024). Hubungan Asupan Protein dengan Kejadian Wasting pada Balita. *PROFESSIONAL HEALTH JOURNAL*, *5*(2), 467–475. https://doi.org/10.54832/phj.v5i2.598