



RESEARCH ARTICLE

Community-Based Insights on Maternal Nutrition Knowledge and Its Role in Preventing Stunting and Wasting in Rural Indonesian Children

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Published online: 8 July 2025

Abstract

Stunting and wasting remain significant public health challenges in Indonesia, with the 2023 SSGI survey reporting prevalences of 21.6% and 7.7% respectively—figures that exceed global targets, especially in rural areas. This qualitative case study, conducted in Mojowarno, Jombang Regency, was chosen due to its persistently high rates of child undernutrition and limited access to nutrition education. The study aimed to explore the relationship between maternal nutrition knowledge and the incidence of stunting and wasting among toddlers. Data were collected from 24 informants, including mothers, health workers, and a community volunteer, through in-depth interviews and triangulated with document and observation data. Results revealed that low maternal nutrition knowledge—characterized by limited understanding of balanced meals, meal timing, and child feeding practices—was a primary driver of malnutrition, regardless of parental occupation or income. The study highlights the urgent need for sustainable, community-based nutrition education interventions and cross-sectoral collaboration. Findings inform local policy and support targeted strategies for reducing stunting and wasting in similar rural contexts.

Keywords: Maternal Nutrition Knowledge; Stunting; Wasting; Toddlers; Rural Indonesia; Community-Based Intervention

ABSTRAK

Stunting dan wasting tetap menjadi tantangan kesehatan masyarakat yang signifikan di Indonesia, di mana Survei Status Gizi Indonesia (SSGI) 2023 melaporkan prevalensi masing-masing sebesar 21,6% dan 7,7%—angka yang masih melebihi target global, terutama di wilayah pedesaan. Studi kasus kualitatif ini dilakukan di Mojowarno, Kabupaten Jombang, yang dipilih karena tingginya angka kekurangan gizi pada anak dan terbatasnya akses edukasi gizi di wilayah tersebut. Penelitian ini bertujuan untuk mengkaji hubungan antara pengetahuan gizi ibu dengan kejadian stunting dan wasting pada balita. Data dikumpulkan dari 24 informan yang terdiri dari ibu balita, tenaga kesehatan, dan kader masyarakat melalui wawancara mendalam, serta triangulasi dengan data dokumen dan observasi. Hasil penelitian menunjukkan bahwa rendahnya pengetahuan gizi ibu—yang tercermin pada pemahaman terbatas tentang pola makan seimbang, jadwal makan, dan praktik pemberian makan anak—menjadi faktor utama terjadinya malnutrisi, terlepas dari pekerjaan atau pendapatan orang tua. Studi ini menyoroti perlunya intervensi edukasi gizi berbasis komunitas yang berkelanjutan serta kolaborasi lintas sektor. Temuan ini dapat menjadi acuan kebijakan lokal dan mendukung strategi terarah untuk menurunkan angka stunting dan wasting di wilayah pedesaan serupa.

Kata kunci: Pengetahuan Gizi Ibu; Stunting; Wasting; Balita; Pedesaan Indonesia; Intervensi Berbasis Komunitas

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INTRODUCTION

Malnutrition in early childhood remains a major public health concern globally and in Indonesia, with stunting and wasting posing persistent threats to optimal growth, cognitive development, and survival among toddlers. According to the World Health Organization (WHO, 2022), in 2022, approximately 148 million children under five were stunted and 45 million suffered from wasting worldwide, with the burden most severe in low- and

middle-income countries. Globally, stunted children are at increased risk for impaired physical and cognitive development, lower educational attainment, and reduced economic productivity later in life (de Onis & Branca, 2016; Black et al., 2013). These adverse effects can perpetuate cycles of poverty and ill-health across generations (Victora et al., 2021).

Indonesia continues to face persistent challenges in this area. The 2023 Indonesian Nutrition Status Survey (SSGI) reported stunting rates at 21.6% and wasting rates at 7.7% among children under five, figures that remain above the World Health Assembly's target of less than 20% for stunting and less than 5% for wasting (Kementerian Kesehatan Republik Indonesia, 2023; WHO, 2022). Furthermore, regional disparities persist, with rural and remote communities experiencing higher rates of undernutrition due to limited access to quality healthcare, lower socio-economic status, and persistent food insecurity (Torlesse et al., 2016; Rizal & van Doorslaer, 2019). These figures highlight that a significant proportion of Indonesian children continue to be deprived of adequate nutrition, both in quantity and quality, during their formative years.

Crucially, addressing stunting and wasting is not merely a matter of ensuring food availability. Contemporary research emphasizes that undernutrition in children is shaped by a complex interplay of social, behavioral, economic, environmental, and especially knowledge-based determinants (Black et al., 2013; Smith & Haddad, 2015; Toma et al., 2023). Maternal nutrition knowledge has emerged as a pivotal factor influencing children's dietary patterns, feeding practices, and overall nutritional status (Fufa, 2022; Mauludyani & Khomsan, 2022; Wahyuni et al., 2023). The UNICEF Framework for the determinants of child undernutrition underscores the central role of caregiver knowledge and behavior—alongside food security, caregiving resources, and the health environment—as immediate and underlying causes of malnutrition (UNICEF, 2023; Black et al., 2013).

Mothers, in particular, are responsible for daily decisions related to food selection, meal frequency, breastfeeding, and the introduction of complementary foods. These decisions are critical determinants of child growth and health outcomes, especially during the first 1,000 days of life—a period recognized as the “window of opportunity” for optimal growth and development (Victora et al., 2021; Mauludyani & Khomsan, 2022; Hardiyanti et al., 2024). Poor maternal knowledge and misconceptions about child nutrition can result in inadequate feeding practices, such as delayed introduction of complementary foods, limited dietary diversity, or insufficient protein and micronutrient intake (Apriluana & Fikawati, 2018; Bancin et al., 2024).

Barriers to improving maternal nutrition knowledge are multifaceted. Several studies highlight that low educational attainment, socio-economic disadvantage, and cultural beliefs often impede the uptake of nutrition information and its application in daily practice (Bancin et al., 2024; Fadlah & Saharuddin, 2023; Maulina et al., 2021). For instance, mothers with limited literacy may not fully understand the benefits of exclusive breastfeeding, the risks of early weaning, or the necessity for dietary diversity (Torlesse et al., 2016; Fufa, 2022). In many cases, decision-making about child feeding is further complicated by gender dynamics, family roles, and broader community norms (Salm et al., 2021).

Efforts to address these challenges require a multisectoral approach. Indonesia has implemented several key policies, including the National Strategy to Accelerate Stunting Prevention (Stranas Stunting), which

promotes integration of maternal and child health services at the community level and supports community-based education through posyandu (community health posts) and local health workers (Kementerian Kesehatan Republik Indonesia, 2022; Andriany et al., 2025). Evidence indicates that interventions involving community participation and tailored to local contexts—such as family nutrition education, mother support groups, and context-specific media—are more effective in improving maternal nutrition knowledge and, consequently, child nutrition outcomes (Hardiyanti et al., 2024; Black et al., 2013; Andriany et al., 2025). However, successful program implementation remains challenged by varying baseline literacy among mothers, inconsistent health promotion strategies, and insufficient resources at the grassroots level (Rizal & van Doorslaer, 2019; Wahyuni et al., 2023).

Despite the increasing body of literature, there is still a need for in-depth qualitative studies that explore how maternal nutrition knowledge translates into daily feeding practices and how these are shaped by social, economic, and environmental factors, especially in rural areas such as Mojowarno. Existing studies are often quantitative and do not adequately capture mothers' perceptions, contextual challenges, or the lived realities of families experiencing stunting and wasting.

Given this context, the present study seeks to address these gaps by exploring the relationship between maternal nutrition knowledge and the incidence of stunting and wasting among toddlers in Mojowarno, Jombang Regency. The study aims to provide nuanced insights into the ways in which mothers' nutrition literacy affects their caregiving and feeding practices and to serve as a foundation for designing more targeted, community-based nutrition interventions. These findings are expected to inform local health policy and contribute to ongoing efforts to reduce child malnutrition in Indonesia, in line with the Sustainable Development Goals and national stunting reduction targets.

METHODS

This research employed a qualitative case study design, specifically an intrinsic case study approach, which was chosen to enable an in-depth exploration of the relationship between maternal nutrition knowledge and the incidence of stunting and wasting among toddlers in a real-life rural context. The intrinsic case study was selected because the phenomenon of interest—maternal nutrition knowledge and its effects on child nutritional status—is deeply embedded in the social, cultural, and economic characteristics of the Mojowarno community, and cannot be adequately understood without considering these contextual factors. This approach is particularly suited for generating rich, contextualized insights that are not always accessible through quantitative or survey-based methods (Stake, 1995; Yin, 2018).

Sampling and Informant Recruitment

Participants were selected using purposive sampling, aiming to capture a range of perspectives from mothers of toddlers with experiences of stunting and wasting, as well as from key informants such as healthcare providers, nutrition officers, and community leaders. The inclusion criteria for mothers were: (1) having at least one child aged 6–59 months diagnosed as stunted or wasted according to

WHO standards, (2) residing in the Mojowarno area for at least one year, and (3) willing to participate in an in-depth interview. Exclusion criteria included mothers who were unable to communicate due to health or language barriers. Key informants were selected based on their direct involvement in child health and nutrition programs at the local level.

To ensure depth and diversity of perspectives, the recruitment process continued until data saturation was reached—that is, when additional interviews no longer produced new themes or insights (Guest et al., 2006). Snowball sampling was also utilized to identify additional relevant informants who met the study criteria.

Data Collection Instruments and Procedures

Data collection involved multiple methods to enhance validity and triangulation: (1) in-depth, semi-structured interviews using a validated interview guide; (2) direct observation of household and community health activities; and (3) review of relevant documents, including child health records (Kartu Menuju Sehat, KMS), growth monitoring charts, and local program reports. The interview guide was developed based on previous literature and expert consultation, covering themes such as maternal knowledge of child feeding, perceived barriers and facilitators, sources of nutrition information, and decision-making processes regarding child feeding.

All interviews were conducted in Bahasa Indonesia by trained researchers, audio-recorded with participant consent, and transcribed verbatim. Observations focused on feeding practices, food availability, and maternal-child interactions during meal times. Field notes were made to capture contextual information. Document analysis complemented interview and observation data by providing objective evidence of growth status and intervention exposure.

Data Analysis

Data were analyzed using the thematic analysis framework of Miles and Huberman (2014), involving three iterative steps: data reduction, data display, and conclusion drawing/verification. In the data reduction phase, transcripts, field notes, and documents were coded inductively to identify emerging themes and categories. The coding process was facilitated by the use of qualitative data analysis software (e.g., NVivo 12) to ensure systematic management and retrieval of coded data. Data were then organized in matrices and visual displays to facilitate comparison across informants and data sources. Conclusions were drawn through an iterative process of identifying patterns, relationships, and divergent cases, followed by verification through member checking and discussion among the research team.

Ethical Considerations and Data Validation

This study was approved by the Institutional Review Board of [Institution Name], and all procedures adhered to the ethical standards set forth in the Declaration of Helsinki. Informed consent was obtained from all participants, who were assured of the confidentiality and anonymity of their responses and the voluntary nature of their participation. Data trustworthiness was strengthened through triangulation of interview, observation, and document data, peer debriefing among research team members, and member checking, wherein selected

participants reviewed summary findings to confirm the accuracy of interpretations.

RESULTS OF STUDY

Characteristics of Informants

Three key informants were selected for their expertise and central roles in the Mojowarno Community Health Center: a midwife coordinator (Mrs. N), the head of the health center with a master's in nutrition (Mrs. Y), and a general practitioner (Mrs. A). Their educational backgrounds—ranging from midwifery to medicine—ensured that the research benefitted from comprehensive clinical and public health perspectives, providing robust triangulation for maternal-child nutrition issues (see Table 1).

Table 1. Characteristics of Key Informants

Informant Code	Time and Date	Educational Background	Position
Mrs. N	09:30	D4 in Midwifery	Midwife Coordinator
Mrs. Y	11:00	Master's Degree in Nutrition	Head of Health Center
Mrs. A	12:00	Bachelor's Degree in Medicine	General Practitioner

The 20 main informants were mothers of toddlers experiencing stunting and/or wasting, selected purposively to represent the community context. The majority were housewives with education levels spanning from elementary to bachelor's degrees. Most of their husbands were farmers or laborers with average incomes around IDR 1–3 million per month, reflecting the economic realities of rural East Java (Table 2). This socioeconomic profile contextualizes both access to and utilization of nutrition information and services. One supporting informant, Mrs. W, a community health volunteer (kader), provided additional context on community nutrition activities, including education dissemination and family engagement (Table 5).

Parental Education and Nutrition Knowledge

Sub-theme: *Impact of Maternal Education on Nutrition Literacy*

A recurring theme in this study was the profound influence of parental—particularly maternal—education on nutrition knowledge and caregiving practices (Table 3). Mothers with higher educational attainment demonstrated a more nuanced understanding of balanced nutrition, the importance of protein, and the critical period of the first 1,000 days. For instance, Mrs. D, a mother with a bachelor's degree, stated:

"I am fully aware of the importance of nutrition from pregnancy through the child's first two years. I make sure my child gets complete nutrition and I routinely monitor growth at the posyandu."

Conversely, mothers with only elementary or Islamic elementary education frequently expressed confusion or lack of awareness about stunting, wasting, and appropriate nutrition, as exemplified by Mrs. E:

“Umm... What are stunting and wasting? What kind of nutrition should be given to prevent that?”

However, the data also revealed outlier cases—a few highly educated mothers whose children still experienced stunting or wasting, often due to competing work demands or limited time for meal supervision (e.g., Mrs. H, bachelor’s degree: “Some parents are highly educated but too busy working... they are still able to apply healthy nutrition for their children, but sometimes, caregivers lack attentiveness.”). This finding aligns with the UNICEF

conceptual framework, emphasizing that maternal knowledge must be supported by enabling environments and consistent caregiving.

Field findings indicate that many parents had low levels of education, mostly below the senior high school level. This low level of education has contributed to the incidence of stunting and wasting in Jombang Regency. Limited educational backgrounds significantly affect parents’ understanding of proper nutrition for children and its importance in preventing stunting and wasting.

Table 2. Characteristics of Main Informants

Informant Code	Time and Date	Education	Occupation		Income	Residence
			Occupation (Mother)	Occupation (Husband)		
Mrs. H	10:00, 05/05/2025	Bachelor’s (S1)	Housewife	Entrepreneur	IDR 1.5 million/month	Mojowarno
Mrs. W	10:00, 05/05/2025	Senior High School	Housewife	Laborer	IDR 2 million/month	Mojowarno
Mrs. M	10:00, 05/05/2025	Diploma (D3)	Entrepreneur	Farmer	IDR 1 million/month	Mojowarno
Mrs. Z	10:00, 05/05/2025	Elementary School	Housewife	Bus Driver	IDR 1.5 million/month	Cetakgayam
Mrs. L	10:00, 05/05/2025	Bachelor’s (S1)	Teacher	Farmer	IDR 3.5 million/month	Cetakgayam
Mrs. SM	10:00, 05/05/2025	Junior High School	Housewife	Entrepreneur	IDR 2 million/month	Mojowarno
Mrs. A	10:00, 05/05/2025	Islamic Elementary School	Housewife	Deceased	IDR 90,000/day	Mojowarno
Mrs. S	10:00, 05/05/2025	Junior High School	Housewife	Farmer	IDR 100,000/day	Menganto
Mrs. An	10:00, 05/05/2025	Bachelor’s (S1)	Housewife	Entrepreneur	IDR 1.5 million/month	Mojojejer
Mrs. B	10:00, 05/05/2025	Elementary School	Housewife	Bus Driver	IDR 1.75 million/month	Sukomulyo
Mrs. Si	10:00, 05/05/2025	Elementary School	Housewife	Farmer	IDR 75,000/day	Cetakgayam
Mrs. De	10:00, 05/05/2025	Senior High School	Housewife	Entrepreneur	IDR 2.5 million/month	Mojowarno
Mrs. D	10:00, 05/05/2025	Bachelor’s (S1)	Teacher	Teacher	IDR 3 million/month	Mojowarno
Mrs. G	10:00, 05/05/2025	Diploma (D3)	Housewife	Entrepreneur	IDR 1 million/month	Cetakgayam
Mrs. I	10:00, 05/05/2025	Bachelor’s (S1)	Nurse	Entrepreneur	IDR 3.5 million/month	Mojowarno
Mrs. E	10:00, 05/05/2025	Elementary School	Housewife	Laborer	IDR 1 million/month	Gedangan
Mrs. M	10:00, 05/05/2025	Junior High School	Laborer	Deceased	IDR 50,000/day	Cetakgayam
Mrs. Mu	10:00, 05/05/2025	Junior High School	Housewife	Farmer	IDR 100,000/day	Mojoduwur
Mrs. H	10:00, 05/05/2025	Elementary School	Housewife	Farmer	IDR 150,000/day	Mojowarno
Mrs. V	10:00, 05/05/2025	Islamic Elementary School	Laborer	Entrepreneur	IDR 1 million/month	Mojowarno

Source: Primary data, 2025

Table 3
Parental Education and Nutrition Knowledge Related to the Incidence of Stunting and Wasting

Informant	Perception of Parental Education Related to the Incidence of Stunting and Wasting
Mrs. H	Bachelor’s degree – Some parents are highly educated but too busy working. There are also caregivers who lack attentiveness. However, they are still able to apply healthy nutrition for their children.
Mrs. W	Senior high school – The education level is high, but in my opinion, it may be because the child has a poor appetite. I don’t think education has much influence.
Mrs. M	Diploma – It is very influential in my opinion, starting from nutrition during pregnancy. If the mother is not well educated, it affects everything.
Mrs. Z	Elementary school – I don’t really understand the right nutrition for my child. I just feed them whatever is available.
Mrs. L	Bachelor’s degree – In my opinion, stunting in children is not only influenced by the toddler phase but also by the mother’s nutrition during pregnancy.
Mrs. SM	Junior high school – I know a little about the “Four Healthy, Five Perfect” nutrition guide.
Mrs. A	Islamic elementary school – We just eat whatever is available.
Mrs. S	Junior high school – What parents eat is also eaten by the children.
Mrs. An	Bachelor’s degree – Parents are busy working so they don’t have time to closely monitor what the child eats.
Mrs. B	Elementary school – I don’t understand which nutrition is right. I just feed them whatever is there. I also don’t know what stunting and wasting are.
Mrs. Si	Elementary school – I know children should eat enough so they don’t get sick. I usually give rice, vegetables if available, and a side dish. But I don’t fully understand which foods help them grow faster or avoid being underweight.
Mrs. De	Senior high school – I know that children need balanced nutrition like carbohydrates, proteins, vitamins, and minerals. But it’s not always possible to meet these needs every day.
Mrs. D	Bachelor’s degree – I am fully aware of the importance of nutrition from pregnancy through the child’s first two years. I make sure my child gets complete nutrition and I routinely monitor growth at the posyandu.
Mrs. G	Diploma – I know that nutrition, especially during the first 1,000 days of life, plays a crucial role in preventing stunting and wasting.
Mrs. I	Bachelor’s degree – Stunting means a child is shorter than their age due to chronic malnutrition. Wasting means the

	child is underweight for their height, usually due to acute malnutrition or repeated infections. Both can be prevented with proper nutrition and parenting.
Mrs. E	Elementary school – Umm... What are stunting and wasting? What kind of nutrition should be given to prevent that?
Mrs. M	Junior high school – I try to provide balanced meals with rice, side dishes, vegetables, and fruit. I also know children need protein and vitamins to grow healthy. But when finances are tight, we just eat whatever we can afford.
Mrs. Mu	Junior high school – I try to give my child tempeh or eggs, but I rarely can buy fruit or milk.
Mrs. H	Elementary school – I don't work, but I already do my best with the food we can afford. As long as the child is active and not sick, I think their nutrition is sufficient, even if it's only rice and vegetables.
Mrs. V	Islamic elementary school – I thought my child was just skinny because of appetite problems. I didn't know that it could be dangerous or considered wasting.

Source: Primary data, 2025

Table 4. Perceptions of Parental Occupation Related to the Incidence of Stunting and Wasting

Informant	Perception of Parental Occupation Related to Stunting
Mrs. H	The parents have irregular jobs, but their child's nutritional status is good. There are also parents with steady jobs whose children are stunted.
Mrs. W	With low wages, they might only be able to meet basic nutritional needs.
Mrs. M	I don't have a job... yes, it really affects our ability to buy nutritious food for the child.
Mrs. Z	Most people around here work in the rice fields.
Mrs. L	I am a teacher and my husband is a farmer.
Mrs. SM	I don't work, I just take care of the children.
Mrs. A	I am a housewife, sometimes I do odd jobs.
Mrs. S	Sometimes we get work if someone offers, and my husband is a rice field farmer.
Mrs. An	I teach at a local Islamic school (TPQ).
Mrs. B	I am a housewife and my husband is a bus driver.
Mrs. Si	I stay home and take care of the children.
Mrs. De	I am a housewife at home.
Mrs. D	I teach at a madrasah.
Mrs. G	I stay at home while my husband works.
Mrs. I	I work at a clinic.
Mrs. E	I am a housewife.
Mrs. M	My husband is a laborer and I am a housewife.
Mrs. Mu	I am a housewife.
Mrs. H	I am a housewife and take care of the children.
Mrs. V	I work as a laborer in the rice fields.

Source: Primary data, 2025

Parental Occupation and Family Income

Sub-theme: Role of Parental Occupation and Socioeconomic Status

Field findings indicate that the type of parental occupation—whether mothers were housewives or engaged in informal labor, and whether fathers were farmers, laborers, or entrepreneurs—was not strongly associated with the incidence of stunting and wasting (Table 4). Informants from various occupational backgrounds reported challenges in providing balanced diets, mainly due to financial constraints rather than employment status per se. Mrs. M shared:

"I don't have a job... yes, it really affects our ability to buy nutritious food for the child."

Meanwhile, Mrs. H noted:

"The parents have irregular jobs, but their child's nutritional status is good. There are also parents with steady jobs whose children are stunted."

These narratives underscore that limited household income and inconsistent employment opportunities can hinder food security and nutritional adequacy, reinforcing the importance of both economic and knowledge-based interventions.

Field findings confirmed that most mothers of toddlers with stunting and wasting worked as housewives, while the fathers worked as laborers or farmers with an average monthly income of around IDR 1 million. Stunting and

wasting occurred in families regardless of whether the parents had high or low incomes. Therefore, the type of parental occupation is not strongly associated with the incidence of stunting.

Role of Community Health Volunteers

Sub-theme: Supporting Community-Based Nutrition Promotion

The supporting informant, Mrs. W, a community health volunteer (kader), played a significant role in disseminating nutrition information and facilitating access to health services (Table 5). Her senior high school education and active involvement at the Mojowarno Health Center highlight the critical link between community-level actors and maternal health outcomes. The engagement of local cadres is consistent with national strategies emphasizing community-based interventions for stunting prevention.

Table 5. Characteristics of the Supporting Informant

Informant Code	Mrs. W
Time and Date	11:00, 05/05/2025
Education	Senior High School
Position	Community Health Volunteer
Location	Mojowarno Health Center

Source: Primary data, 2025

Toddler Characteristics

Sub-theme: Demographic and Anthropometric Profiles of Toddlers

The toddlers included in this study represented both genders, various ages (20–47 months), and a wide range of weights and heights (Table 6). Notably, field data indicated that gender was not significantly associated with stunting or wasting; both boys and girls were equally affected, a finding confirmed by health professionals. Mrs. N (midwife coordinator) stated:

“The indicators of stunting and wasting in Jombang are based on weight and height. As for gender, both girls and boys are equally affected.”

The majority of toddlers fell below growth standards for their age, as documented in the Maternal and Child Health Handbook, which aligns with national data on high stunting prevalence in rural Indonesia.

Table 6. Characteristics of Toddlers

Toddler Code	Gender	Age (months)	Weight (kg)	Height (cm)
Ba. H	Female	37	9.7	79
Ba. W	Female	47	13.4	90
Ba. M	Female	36	7.5	75
Ba. Z	Female	35	12	90
Ba. L	Male	21	8.5	80
Ba. SM	Male	46	12.5	88
Ba. A	Male	29	11	80.5
Ba. S	Male	40	12	78
Ba. An	Female	42	11	79
Ba. B	Female	47	13.4	90
Ba. Si	Female	20	6.5	73
Ba. De	Female	47	12	90
Ba. D	Male	21	8.5	79
Ba. G	Male	46	11.5	79
Ba. I	Male	29	9.5	79
Ba. E	Male	40	12	78
Ba. M	Female	42	11	79
Ba. Mu	Female	36	10	90
Ba. H	Female	30	9.5	80
Ba. V	Female	47	12.5	95

Source: Primary data, 2025 Source: Primary data, 2025

Parental and Informant Perceptions of Stunting and Wasting

Sub-theme: Understanding of Stunting, Wasting, and Feeding Practices

Mothers’ perceptions of stunting and wasting varied widely, with several mothers unaware of these terms or their implications for child health (Table 3). Knowledge gaps led to suboptimal feeding practices, such as providing whatever food was available, irregular meal schedules, or limited dietary diversity. Mrs. Z summarized this by saying:

“I don’t really understand the right nutrition for my child. I just feed them whatever is available.”

This is consistent with previous findings that low maternal nutrition literacy is a risk factor for chronic undernutrition and is supported by the UNICEF framework emphasizing knowledge and caregiving as key determinants.

Case Study Findings on Toddler Characteristics

The findings from the case study on toddler characteristics indicate that gender does not have a significant relationship with the incidence of stunting and wasting in the Mojowarno Community Health Center area. This conclusion is supported by the following statements from informants in Tabel 7.

Overall, the study underscores the centrality of maternal nutrition knowledge—shaped by education and supported by community structures—as a crucial factor in preventing stunting and wasting among toddlers in rural Indonesia. These results reinforce the need for integrating family-centered nutrition education, community empowerment, and contextually sensitive interventions within public health strategies.

Table 7. Perceptions of Toddler Characteristics Related to Stunting and Wasting

Informant	Perception of Toddler Characteristics Related to Stunting
Mrs. N	The indicators of stunting and wasting in Jombang are based on weight and height. As for gender, both girls and boys are equally affected.
Mrs. Y	I think gender does not play a role. However, age, body weight, and height are indeed related to stunting.
Mrs. A	Essentially, it is a matter of growth failure within the first 1,000 days of life.
Mrs. W	Currently, body weight really does have an influence.

DISCUSSION

The present study provides critical insight into the complex relationship between maternal nutrition knowledge and the incidence of stunting and wasting among toddlers in rural Indonesia. The findings highlight that maternal education and nutrition knowledge play a more decisive role in determining child nutritional outcomes than factors such as parental occupation or household income. This observation is consistent with the UNICEF framework, which positions caregiver knowledge and behavior as immediate causes of child undernutrition, alongside food security and health environment (UNICEF, 2023; Black et al., 2013).

A core theme emerging from the data is the profound influence of maternal education on both nutrition knowledge and caregiving practices. Mothers with higher levels of education demonstrated greater awareness and understanding of balanced diets, the significance of the first 1,000 days of life, and the importance of protein and micronutrients in child growth. These mothers were more likely to engage with growth monitoring and health services, such as the posyandu, and to implement feeding practices aligned with national recommendations. This finding supports previous research indicating that maternal education is strongly correlated with improved child health outcomes and lower risk of stunting (Mauludyani & Khomsan, 2022; de Onis & Branca, 2016; Wahyuni et al., 2023).

Conversely, mothers with limited formal education exhibited significant gaps in their knowledge of optimal nutrition, appropriate meal frequency, and the risks associated with inadequate protein or dietary diversity.

These mothers often fed their children whatever was available, with little understanding of stunting or wasting as medical conditions. This is in line with studies by Apriluana and Fikawati (2018) and Bacin et al. (2024), which found that low maternal literacy and nutrition knowledge increase the risk of chronic undernutrition and contribute to persistent cycles of poor child health. Furthermore, qualitative data revealed that even among educated mothers, barriers such as time constraints, work obligations, or lack of consistent caregiving can limit the application of nutrition knowledge, leading to cases of stunting or wasting—demonstrating that knowledge alone is not always sufficient without supportive household and community environments (Victora et al., 2021).

Interestingly, this study found no significant association between parental occupation or gender of the child and the incidence of stunting or wasting, echoing results from Bahriyah (2024) and Rahayuwati et al. (2023). Stunting was observed in children from both lower- and higher-income households, as well as across all occupational backgrounds. This suggests that economic factors alone may not fully explain the persistence of undernutrition, particularly in rural or low-resource settings where access to nutrition education and health services may be limited (Rizal & van Doorslaer, 2019; Smith & Haddad, 2015). The finding that gender does not influence stunting risk further aligns with national and international studies (Toma et al., 2023), supporting the conclusion that anthropometric outcomes are primarily shaped by nutrition and caregiving, rather than biological sex.

Another important theme is the vital role played by community health volunteers (kader) in bridging gaps between formal health systems and families. The supporting informant in this study, a cadre with senior high school education, was instrumental in disseminating nutrition information and encouraging mothers to participate in health monitoring programs. This supports evidence that community-based, peer-led interventions are effective in improving maternal knowledge and child nutrition outcomes (Hardiyanti et al., 2024; Andriany et al., 2025).

The practical implications of these findings are significant for health policy and intervention design. First, they underscore the need for sustained, context-sensitive nutrition education that targets not only mothers with low formal education, but also working mothers and other caregivers. Interventions should integrate tailored health messaging, practical demonstrations, and culturally appropriate communication strategies to improve the translation of knowledge into daily practice (UNICEF, 2023; Black et al., 2013). Family nutrition education, when combined with community empowerment and participatory approaches—such as mother support groups and engagement with posyandu cadres—has been shown to be effective in reducing child undernutrition (Hardiyanti et al., 2024). Second, strengthening collaboration between health workers, community cadres, and local government is essential for building sustainable support systems. This includes providing ongoing training and supervision for cadres, developing local champions for nutrition, and supporting family-level initiatives that reinforce consistent feeding and care practices (Andriany et al., 2025).

Despite its strengths, this study has several limitations. The intrinsic case study design, while valuable for generating rich, contextualized insights, may limit generalizability to other rural or urban populations in Indonesia. The reliance on self-reported data and in-depth interviews may introduce recall or desirability bias.

Additionally, the study did not quantitatively assess dietary intake, limiting the ability to directly link specific nutrition behaviors to growth outcomes. Future research should consider mixed-methods designs, larger sample sizes, and longitudinal tracking to capture changes over time and strengthen causal inference. In conclusion, this study reaffirms the centrality of maternal nutrition knowledge in preventing stunting and wasting among toddlers, and highlights the need for ongoing, community-driven nutrition education tailored to local contexts. Policy makers should prioritize investments in education, family empowerment, and integrated community health systems as foundational strategies for achieving national and global child nutrition targets.

CONCLUSION AND RECOMMENDATION

This study confirms that maternal nutrition knowledge is a pivotal factor contributing to the incidence of stunting and wasting among toddlers in rural Indonesia. The findings reveal that low levels of maternal knowledge regarding balanced nutrition, appropriate meal scheduling, and optimal child feeding practices significantly increase the risk of undernutrition. While economic and educational backgrounds also play roles, it is the mother's understanding and application of nutritional knowledge that most directly shapes daily dietary practices for children. Notably, the study found that even mothers with higher educational attainment may not consistently apply nutritional knowledge, indicating that knowledge alone is insufficient without adequate support and enabling environments.

The novelty of this study lies in its qualitative exploration of maternal and community perspectives, highlighting not only the knowledge gaps but also the contextual challenges faced by rural families. The results emphasize the importance of moving beyond traditional economic interventions to address behavioral and informational determinants of child nutrition. The role of community health volunteers and cadres in bridging information gaps and supporting families is particularly evident, reaffirming the value of community-based strategies.

Practical Recommendations:

Local health authorities and stakeholders should prioritize the development and implementation of continuous, community-based nutrition education programs. Such programs should target mothers, caregivers, and family members, utilizing culturally relevant media, practical demonstrations, and local support groups to improve maternal knowledge and skills. Training for community health volunteers (kader) should be expanded to enhance their capacity as frontline educators and motivators for behavior change. Interventions should not be limited to mothers with low education, but also support working mothers, grandmothers, and other caregivers who share responsibility for child feeding.

Policy Recommendations:

A cross-sectoral approach is required, involving collaboration between the health, education, agriculture, and social sectors to address the multifactorial nature of stunting and wasting. Policy makers should integrate nutrition education into broader maternal and child health

services, strengthen monitoring and evaluation systems at the community level, and ensure adequate funding for ongoing training and supervision of cadres. Innovations in educational media—such as interactive apps, radio programs, and context-adapted visual tools—should be explored to reach wider audiences and reinforce key nutrition messages.

ACKNOWLEDGMENT

The authors would like to express their sincere gratitude to all individuals and institutions who supported the successful completion of this study. Special appreciation is extended to the healthcare staff and midwives at Mojowarno Community Health Center, Jombang Regency, for their cooperation and support during data collection. The authors also wish to thank the mothers of toddlers who voluntarily participated and provided valuable insights that enriched the findings of this research.

DECLARATIONS

Ethics Approval and Consent to Participate

This study was conducted in accordance with ethical principles involving human subjects. All participants received a thorough explanation of the study's objectives, procedures, benefits, and potential risks. Written informed consent was obtained from each participant. Participation was entirely voluntary, and respondents were free to withdraw at any stage without penalty. All personal data were kept confidential and used solely for research purposes.

Competing Interests

The authors declare that there are no competing interests.

Funding

This study was conducted without any external financial support or funding.

Availability of Data and Materials

All data supporting the findings of this study are included in the manuscript. Additional data may be provided by the corresponding author upon reasonable request.

REFERENCES

- Andriany, A., Ahmar, H., & Sianturi, S. H. (2025). Mitigating child stunting: Community-based strategies in Maibo Village, Sorong Regency, Indonesia. *Journal of Current Health Sciences*, 5(2), 91–96. <https://doi.org/10.47679/jchs.2025114>
- Apriluana, G., & Fikawati, S. (2018). Analisis faktor-faktor risiko terhadap kejadian stunting pada balita (0–59 bulan) di negara berkembang dan Asia Tenggara. *Media Litbangkes*, 28(4), 247–256. <https://ejournal2.litbang.kemkes.go.id/index.php/mpk/article/view/472/537>
- Bahriyah, F. . (2024). Hubungan Pekerjaan Ibu dengan Status Gizi Balita Studi Kasus di Desa Sukajadi. *Public Health and Safety International Journal*, 4(01), 25 – 28. <https://doi.org/10.55642/phasij.v4i01.661>
- Bancin, A., Aidha, Z., & Ashar, Y. K. (2024). The relationship between mothers' knowledge and behavior about nutritional status with the incidence of stunting. *Indonesian Journal of Global Health Research*, 6(3), 1747–1758.
- Black, R. E., Victora, C. G., Walker, S. P., Bhutta, Z. A., Christian, P., de Onis, M., Ezzati, M., Grantham-McGregor, S., Katz, J., Martorell, R., & Uauy, R. (2013). Maternal and child undernutrition and overweight in low-income and middle-income countries. *The Lancet*, 382(9890), 427–451. [https://doi.org/10.1016/S0140-6736\(13\)60937-X](https://doi.org/10.1016/S0140-6736(13)60937-X)
- de Onis, M., & Branca, F. (2016). Childhood stunting: A global perspective. *Maternal & Child Nutrition*, 12(S1), 12–26. <https://doi.org/10.1111/mcn.12231>
- Fadlah, N. U., & Saharuddin, E. (2023). Hubungan pengetahuan ibu terhadap stunting sebagai upaya peningkatan pelayanan kesehatan (Studi pada: Kalurahan Caturharjo). *Jurnal Administrasi Pemerintahan Desa*, 4(2), 159–175. <https://doi.org/10.47134/villages.v4i2.50>
- Fufa, D. A. (2022). Determinants of stunting in children under five years in Dibate District of Ethiopia: A case-control study. *Human Nutrition & Metabolism*, 30, 200162. <https://doi.org/10.1016/j.hnm.2022.200162>
- Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field Methods*, 18(1), 59–82. <https://doi.org/10.1177/1525822X05279903>
- Hardiyanti, S., Rekawati, E., Setiawan, A., & Rahmadiyah, D. C. (2024). Effectiveness of family nutrition education on the incidence of stunting: Systematic review. *Indonesian Journal of Global Health Research*, 6(3), 1231–1242.
- Kementerian Kesehatan Republik Indonesia. (2022). *Buku Saku Hasil Survei Gizi Indonesia (SSGI) Tahun 2022*. Jakarta: Badan Kebijakan Pembangunan Kesehatan.
- Kementerian Kesehatan Republik Indonesia. (2023). Hasil Survei Status Gizi Indonesia (SSGI) 2023. Jakarta: Kemenkes RI.
- Maulina, R. U., Marfari, C. A., & Elmiyati, E.. (2021). Hubungan pengetahuan, sikap, dan perilaku ibu balita terhadap stunting di Kecamatan Kuta Baru. *Jurnal Ilmu Kedokteran dan Kesehatan*, 8(1), 19–27. <https://doi.org/10.33024/jikk.v8i1.3388>
- Mauludyani, A. V. R., & Khomsan, A. (2022). Maternal Nutritional Knowledge as a Determinant of Stunting in West Java: Rural-Urban Disparities: Pengetahuan Gizi Ibu Sebagai Determinan Stunting di Jawa Barat: Disparitas Perdesaan-Perkotaan. *Amerta Nutrition*, 6(1SP), 8–12. <https://doi.org/10.20473/amnt.v6i1SP.2022.8-12>
- Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative Data Analysis: A Methods Sourcebook* (3rd ed.). Sage.
- Rahayuwati, L., Komariah, M., Sari, C. W. M., Yani, D. I., Hermayanti, Y., Setiawan, A., Hastuti, H., Maulana, S., & Kohar, K. (2023). The Influence of Mother's Employment, Family Income, and Expenditure on Stunting Among Children Under Five: A Cross-Sectional Study in

Indonesia. *Journal of multidisciplinary healthcare*, 16, 2271–2278. <https://doi.org/10.2147/JMDH.S417749>

Rizal, M. F., & van Doorslaer, E. (2019). Explaining the fall of socioeconomic inequality in childhood stunting in Indonesia. *SSM - population health*, 9, 100469. <https://doi.org/10.1016/j.ssmph.2019.100469>

Salm, L., Verstraeten, R., Nisbett, N., & Booth, A. (2021). Exploring the drivers of malnutrition in West Africa from health and social science perspectives: A comparative methodological review. *Methodological Innovations*, 14(3). <https://doi.org/10.1177/20597991211051445>

Smith, L. C., & Haddad, L. (2015). Reducing child undernutrition: Past drivers and priorities for the post-MDG era. *World Development*, 68, 180–204. <https://doi.org/10.1016/j.worlddev.2014.11.014>

Stake, R. E. (1995). *The Art of Case Study Research*. Sage.

Toma, T. M., Andargie, K. T., Alula, R. A., Kebede, B. M., & Gujo, M. M. (2023). Factors associated with wasting and stunting among children aged 06–59 months in South Ari District, Southern Ethiopia: a community-based cross-sectional study. *BMC Nutrition*, 9(1). <https://doi.org/10.1186/s40795-023-00683-3>

Torlesse, H., Cronin, A. A., Sebayang, S. K., & Nandy, R. (2016). Determinants of stunting in Indonesian children: Evidence from a cross-sectional survey indicate a prominent role for the water, sanitation and hygiene sector in stunting reduction. *BMC Public Health*, 16, 669. <https://doi.org/10.1186/s12889-016-3339-8>

UNICEF. (2023). *Improving Young Children's Diets during the Complementary Feeding Period*. <https://www.unicef.org>

Victora, C. G., Christian, P., Vdaletti, L. P., Gatica-Domínguez, G., Menon, P., & Black, R. E. (2021). Revisiting maternal and child undernutrition in low-income and middle-income countries: Variable progress towards an unfinished agenda. *The Lancet*, 397(10282), 1388–1399. [https://doi.org/10.1016/S0140-6736\(21\)00394-9](https://doi.org/10.1016/S0140-6736(21)00394-9)

Wahyuni, F. C., Karomah, U., Basrowi, R. W., Sitorus, N. L., & Lestari, L. A. (2024). The Relationship between Nutrition Literacy and Nutrition Knowledge with the Incidence of Stunting: A Scoping Review: Hubungan Literasi Gizi dan Pengetahuan Gizi terhadap Kejadian Stunting: A Scoping Review. *Amerta Nutrition*, 7(3SP), 71–85. <https://doi.org/10.20473/amnt.v7i3SP.2023.71-85>

World Health Organization (WHO). (2022). *World Health Statistics 2022: Monitoring Health of the SDGs*. <https://www.who.int/data/gho/publications/world-health-statistics>

Yin, R. K. (2018). *Case Study Research and Applications: Design and Methods* (6th ed.). Sage.

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