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Mothers' experiences implementing Local Food-Based Feeding Recommendations (LFFRs) for stunted children in Malang, Indonesia: a narrative study

Pengalaman ibu dalam menerapkan Pedoman Gizi Seimbang Berbasis Pangan Lokal (PGS-PL) bagi anak stunting di Malang, Indonesia: Studi naratif

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Abstract

Local Food-Based Feeding Recommendations (LFFRs) were developed to fulfill the nutritional needs of stunted toddlers but remain underexplored in community settings. This study systematically examined child feeding practices based on LFFRs and investigated the contextual factors, challenges, and strategic efforts influencing their implementation by mothers of toddlers. A qualitative narrative design was used. Six mothers of toddlers were purposively selected and participated in in-depth interviews, each lasting 45–60 min. Data collection was conducted over two months. Thematic analysis was used to identify key patterns, and source triangulation was applied to enhance the credibility and trustworthiness of the findings. The analysis of the interview data revealed five main categories and 12 subthemes. These main categories were: (1) Overview of LFFRs implementation, (2) Factors influencing TIPs LFFRs, (3) Challenges in implementing TIPs LFFRs, and (4) Strategies to improve children's intake. The findings revealed varied consumption patterns, with animal-based proteins (mainly eggs and chicken) dominating, limited intake of plant-based proteins (primarily tofu and tempeh), and fluctuating fruit, vegetable, and dairy consumption. Key barriers included children's food preferences, time constraints, limited knowledge of local food preparation (e.g., wader fish and fresh milk), and perceived food-related risks. Adaptive strategies, such as diverse food processing and small frequent feedings, were employed by some mothers. These findings highlight the need for context-specific nutrition education and practical support for mothers, complemented by further research, evidence-based visual modules, practical caregiver training, and strengthened cross-sectoral collaboration to ensure the sustainable implementation of LFFRs and local food availability.

Keywords: LFFRs, toddlers, stunting, feeding practices, local food, qualitative study, nutrition education

Abstrak

Pedoman Gizi Seimbang berbasis Pangan Lokal (PGS-PL) dikembangkan untuk mencukupi kebutuhan zat gizi balita stunting, namun implementasinya di masyarakat belum banyak dikaji. Penelitian ini secara sistematis menelaah praktik pemberian makan anak berdasarkan PGS-PL serta mengeksplorasi faktor kontekstual, tantangan, dan strategi yang memengaruhi implementasinya oleh ibu balita. Dengan menggunakan desain naratif kualitatif, enam ibu balita yang dipilih secara purposif berpartisipasi dalam wawancara mendalam selama 45–60 menit yang dilaksanakan selama dua bulan. Data dianalisis secara

tematik dengan triangulasi sumber untuk memastikan kredibilitas, menghasilkan lima kategori utama dan dua belas subtema. Hasil menunjukkan variasi dalam konsumsi protein hewani (dominan telur dan ayam), nabati (terbatas tahu dan tempe), serta konsumsi buah-sayur dan susu yang bervariasi. Hambatan utama meliputi preferensi anak, keterbatasan waktu, ketidaktahuan pengolahan pangan lokal (ikan wader, susu segar), serta persepsi risiko. Strategi adaptif berupa pengolahan menu variatif dan pemberian porsi kecil tapi sering diterapkan sebagian ibu. Temuan ini menegaskan perlunya edukasi gizi yang kontekstual, modul visual berbasis bukti, pelatihan bagi pengasuh, serta penguatan kolaborasi lintas sektor untuk mendukung implementasi PGS-PL yang berkelanjutan dan ketersediaan pangan lokal.

Kata Kunci: PGS-PL, balita, stunting, praktik pemberian makan, pangan lokal, studi kualitatif, edukasi gizi

Introduction

The Local Food-Based Balanced Nutrition Guidelines (LBB-NG) were designed to meet the macro, micro, and amino acid needs of stunted non-wasted (SNW) toddlers aged 12–24 months in the Pujon and Ngantang Districts. Based on optimization results, local foods have been proven to meet the nutritional needs of stunted toddlers (Wirawan et al., 2023). However, before these guidelines can be widely implemented in areas with similar characteristics, a pilot study is required. One method used in this pilot process is the Trial of Improved Practices (TIPs), which serves to test the effectiveness of the previously prepared LBB-NG draft (Matiri et al., 2025).

TIPs are used to explore various inhibiting and supporting factors that could potentially influence the adaptation and implementation of food recommendations while facilitating the implementation process. Furthermore, the information obtained through this method is very useful in designing appropriate educational messages to support behavior change strategies, particularly in the context of implementing LBB-NG (Brouwer et al., 2017). These trials also play an important role in assessing the feasibility and sustainability of nutritional interventions.

Mothers play an important role in feeding children, although fathers, grandparents and mothers may also be involved (Quinn et al., 2022). The results of TIPs on toddlers aged 12–23 months in Myanmar showed that some mothers were reluctant to give liver and roselle to their children due to concerns about potential side effects, such as worms from consuming liver or digestive disorders from consuming roselle (Hlaing et al., 2016). These worries eliminate the opportunity to consume nutritious foods.

Thus, the TIPs results can form the basis for a more effective approach to educating and motivating communities to adopt child feeding practices appropriate to the regional characteristics in Indonesia. Based on this, the researchers aimed to examine the implementation of LBB-NG and the supporting and inhibiting factors in meeting the nutritional needs of stunted children in Malang Regency, Indonesia.

Methods

This study used a qualitative method with a narrative approach. This narrative approach was chosen because it emphasizes the meaning an individual gives to an experience through the medium of storytelling. This experience is interpreted and summarized as a personal experience (Tomaszewski et al., 2020).

The primary informants were mothers of toddlers aged 12-24 months in Pujon and Ngantang Districts, Malang Regency, who met the criteria of having received an explanation and implemented LBB-NG for approximately two months. Six individuals participated in this study. Data collection was completed after six informants due to a lack of new information or data saturation. Time and resource constraints were also factors limiting the number of informants.

Data were collected using semi-structured in-depth interviews. The interviews lasted approximately 45-60 minutes, following in-depth interview guidelines, using a recorder, and were conducted face-to-face. The research data were manually transcribed and analyzed using Microsoft Excel for coding, categorization, and theme development. This study employed

thematic analysis. Source triangulation was performed to ensure the credibility of the data. Triangulation was performed by comparing the transcriptions between the key informants. Ethical approval was obtained from the FIKES Universitas Brawijaya Ethics Committee on August 12, 2024, under registration number 11896/UN10.F17.10.4/TU/2024.

Result and Discussion

Informant Characteristics

The in-depth interviews were conducted with six mothers of toddlers aged 12-24 months, with variations in age, highest level of education, and residential information, as shown in Table 1.

Table 1. Informant Characteristics

Informant code	Age (year)	Last education	Nuclear/extended family
IU1	35	D4/S1	Nuclear family
IU2	24	Senior high school	Nuclear family
IU3	21	Junior high school	Extended family
IU4	36	Junior high school	Extended family
IU5	26	D4/S1	Nuclear family
IU6	28	Senior high school	Nuclear family

Theme 1: Overview of LBB-NG Implementation

The results indicate that mothers' child feeding practices, within the context of the Local Food-Based Balanced Nutrition Guidelines (LBB-NG), reflect a strong preference for foods that are familiar, readily available, and suited to children's tastes. Table 2 presents more details on food ingredient identification, as well as an overview of daily consumption and its applications.

Protein consumption patterns

Regarding animal protein, the interview results indicated that eggs were the most frequently consumed source of animal protein by children and were the primary choice for most informants. Eggs are preferred because they are easy to prepare, acceptable to children of all eating abilities, and available in various forms, such as free-range chicken, duck, and quail eggs.

"The most common animal protein is eggs, and I don't think I can chew anything else besides eggs yet..." (IU4, 36 years old)

"The most common animal protein is egg. Chicken eggs, quail eggs, free-range eggs..." (IU5, 25 years).

In addition to eggs, chicken is frequently consumed, as mentioned by several informants. Chicken is considered the most familiar and easily accepted animal dish for children. However, the consumption of other animal proteins, such as fish and seafood, such as shrimp, tends to be limited and influenced by children's preferences. Some informants stated that fish consumption is still low because of children's aversion to certain fishy odors or textures. However, others stated that their children still enjoy certain seafood types. This indicates a variety of dietary preferences and openness to fish consumption, depending on the processing method and type.

"I want fish, miss, but only one, two, or three bites at a time. I've only eaten catfish, tuna, and pindang fish." (IU6, 28 years old)

"The fish I often eat are tilapia and pindang fish." (IU4, 36 years).

Eggs and chicken are the most common choices, fish is consumed selectively, and seafood is consumed by only a small percentage of children. Children's preferences, food texture, and chewing ability are determining factors in choosing animal protein sources for the family (Neufingerl & Eilander, 2023).

Based on the results of the interviews related to vegetable protein, it was found that the consumption of vegetable protein sources in children was mostly tofu and tempeh because they were easy to obtain and had become part of the family's diet.

"The vegetable protein that children often eat is tempeh, in the morning they don't know what tempeh is... the children like this soy milk, the one at Mlijo (shopping place)" (IU1, 35 years old)

"The most common vegetable protein is tempeh, tofu, yes, that's all" (IU5, 26 years).

Three informants confirmed similar consumption patterns in the study. However, the study also found that one informant stated that

her child didn't particularly like tofu and tempeh, but preferred soy milk and red beans.

"He does not really like tempeh or tofu vegetable protein. He likes short, sweetened condensed milk...he likes red beans and red beans" (IU6, 28 years old)

Variations in plant-based protein consumption can arise depending on the child's preferences and the parents' ability to introduce different food types. In general, the children in this study primarily consumed plant-based protein, including tofu, tempeh, and soy milk, with additional variations, such as red beans.

These findings also show that while tofu and tempeh are already widely consumed, it is important for parents to explore other plant-based sources that meet their children's preferences. Availability, affordability, and taste are key considerations when choosing plant-based protein sources (Khamis et al., 2019).

One way to strengthen the LBB-NG program is to increase the consumption of local food ingredients, including wader fish. Interviews showed that wader fish, despite being a common freshwater fish in the research area, were rarely or never consumed by the children of the informants interviewed. The majority of informants stated that they had never given wader fish to their children

"I've never caught wader fish, never, I've never caught wader fish, never." (IU2, 24 years old)

"I've never caught wader fish, never" (IU5, 26 years old)

The main reason cited was the numerous fine bones that make consumption difficult, particularly for young children. Other informants expressed similar views. These statements indicate that wader fish are not part of children's regular diets because of safety concerns (risk of bones).

"I've actually tried wader fish, sis, but I've only tried it once when I was cooking" (IU1, 35 years old)

Interestingly, one informant stated that he had tried giving his child wader fish, but only as a one-time introduction. This suggests that efforts have been made to introduce wader fish, but have not yet led to regular consumption. Overall, these findings suggest that wader fish is not yet a common choice for children due to reasons such as its bones and perceived lack of practicality compared to meat or eggs (Headey et al., 2018).

Regarding frequency, most informants stated that their children consumed it almost daily but in varying amounts. Some informants described consuming animal protein up to three times a day, but this was not consistent.

"If it's animal-based, it doesn't have to be [not always], meaning [animal] protein can be eaten four times a week, but sometimes in a day it's only during the day and night..." (IU1, 35 years old)

The frequency of consumption of plant-based proteins, such as tofu and tempeh, tends to be lower, at only 1-2 times per day. The informants stated that plant-based proteins are usually served in the morning or as snacks.

"Animal protein three times a day, at every meal there is always animal protein... Sometimes vegetable protein like tofu and tempeh, I give it to them during snack time, sometimes twice, sometimes once" (IU5, 26 years old).

In general, these findings indicate that animal protein consumption tends to be higher than plant protein consumption, although neither is always served consistently every day or at every meal. Several studies have shown a similar pattern, with higher consumption of animal protein sources (meat 5-6 times/week, eggs 4-5 times/week) than plant protein sources (1 time/week) (Khaliq et al., 2025; Marinho et al., 2023; Nantel & Gingras, 2023).

Fruit and vegetable consumption patterns

Interview resultsindicatede that fruit and vegetable consumptionwass quite varied,but remaineds selective about certain types. Several informants whose children enjoyed eating fruits found a wide variation in their fruit and vegetable consumption. "I want all kinds of fruit, most often dragon fruit, but also bananas, papaya, melon, and watermelon. If they don't have any, I usually buy longans, and pears, too often." (IU4, 36 years old).

Vegetables are mostly served in soup or as clear soup. This suggests that preparing vegetables in a familiar, mild-tasting form is more easily accepted by children and serves as a parental strategy for maintaining fiber and micronutrient intake (Millen et al., 2019).

"For example, if you want to cook vegetables, you also want it, but what you want is carrots, potatoes, most often soup... if it's clear, spinach, but carrots and potatoes are often the ones... gondes [chayote] also want it, sueneng" (IU6, 28 years old)

However, not all children have the same preferences for fruits and vegetables. Some informants also explained that they only consume certain types of fruit and vegetables, depending on the child's preferences, or even avoid them altogether

"Bananas, melons, sometimes watermelon, sometimes oranges, picky about it, usually avocado juice" (IU2, 24 years old)

"Carrots and mustard greens usually, you can be picky about Ms. Maeme" (IU2, 24 years old)

"I don't like fruit, I don't like fruit at all, so I [don't consume fruit at all]." (IU3, 21 years old)

The results of this study indicate that the frequency of fruit and vegetable consumption varies. These consumption patterns are not always consistent, as they are heavily influenced by children's preferences, parental initiative, and the availability of food at home (Alhidayati et al., 2023).

Regarding vegetable consumption, most informants stated that their children consumed vegetables at least once or twice daily. However, this consumption was not always consistent, especially when the child refused to eat.

"The frequency of vegetables is at most once or twice a day, sometimes but I don't want to, at most four times a week, I want... the frequency of fruit can be once a day" (IU2, 24 years old)"

Two other informants reported regular vegetable consumption. This finding indicates a stronger family commitment to making vegetables a mandatory component of every meal, even if they do not always include fruit.

"I have vegetables almost every day, twice a day. I usually have fruit in the afternoon, and if I ask for more, I'll give it to you in the evening." (IU4, 36 years old)

"I have to have vegetables every day, two to three times a day. I don't have any fruit." (IU3, 21 years old)

Researchers observed that fruit was often given upon request and not as part of a daily routine. In fact, some informants found that their children did not consume fruit at all. Some children had diets close to the recommended balanced nutritional intake. However, others have shown limited access, both in terms of the types of food and the frequency of consumption (Kähkönen et al., 2021). It is necessary to focus on educating mothers to introduce fruits and vegetables at an early age (Seifu et al., 2024).

Milk consumption patterns

Research results have shown that milk consumption patterns among young children vary widely. Generally, the types of milk consumed include formula and UHT/packaged milk, whereas fresh milk is relatively rare.

"Do you have fresh milk, miss? I used to like it, but I rarely buy it." (IU1, 35 years old)

"I usually drink packaged milk, but this is my first time. Sometimes it is Mimi, and sometimes it is Frisian Flag strawberry flavor. I've never had fresh cow's milk." (IU3, 21 years old)

Five informants stated that their children did not regularly consume fresh milk and preferred packaged milk or milk formula. Research indicates that fresh milk is significantly cheaper than formula. Furthermore, formula is known to contain higher sugar and fat content per 100 ml (McCann et al., 2022). Additionally, other studies have shown that children tend to consume more flavored milk than plain milk (Lott et al., 2019).

"Sister, I drink formula milk, sometimes Vidoran, sometimes Morigrow, not necessarily, he said. Fresh cow's milk, sometimes also packaged milk in boxes" (IU2, 24 years old)

However, parents were also aware of the nutritional composition of packaged milk, particularly its sugar content. This indicates a concern for nutritional quality and a willingness to choose products with better nutritional value, even if they are more costly.

"I like to drink packaged milk, like Indomilk, Frisian Flag, those are the ones that have the highest percentage of sugar content, they have more sugar, so I prefer the slightly more expensive Ultra, my child doesn't give me the strawberry one." (IU6, 28 years old)

Self-perception of the implementation of LBB-NG

Research findings reveal that the implementation of LBB-NG in early childhood is still suboptimal in terms of food diversity and adequacy of consumption portions. Although most informants reported efforts to implement the guidelines, various limitations remain in their daily practice. The informants stated that not all food components of the guidelines were consistently implemented.

"As for the implementation (types), it's still not optimal, sis, because I don't implement wader, fresh milk, and vegetables. The main thing that I missed was fresh milk and wader. If the others are

consumed, God willing, they are implemented, it's just the size (portion) that isn't" (IU1, 35 years old)

In practice, the informants experienced difficulties in managing their children's meal portions appropriately. Another informant stated that their children's eating patterns did not align with the guidelines as they often consumed incomplete portions in one meal.

"My child's food is not what I want, it is not according to the guidebook... Sometimes I just eat this type of food, like rice with mutton and egg, like that, not all at once, just rice, vegetables, mutton, animal protein, and so on, not a complete variety." (IU2, 24 years old)

This shows that there are still challenges in arranging a balanced menu according to LBB-NG, both from the perspective of children who are still picky eaters and from the perspective of mothers' ability to prepare food for the family.

Theme 2: Factors Influencing PGS-PL TIPs

Mother's motivation

The results of this study indicate that the main motivation of parents in providing nutritious food to children is to support physical growth, especially related to increasing body weight (BW) and height (H), and overall development.

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"Motivation is checking [so] that I can increase my weight, so the point is to increase my weight and height." (IU2, 24 years old)

"Motivation is definitely about wanting to improve my weight, not just for my growth, but also for my development, so protein is important too." (IU5, 26 years old)

One informant stated that the motivation for providing nutritious food is not only for growth but also for overall child development, including cognitive and motor skills. This indicates a broader awareness of the importance of nutritional intake in supporting children's growth and development.

However, this motivation often clashes with the realities of everyday parenting, particularly children's disinterest or refusal of prepared food, which impacts the consistency of providing a nutritionally balanced diet for children.

"Yes, maybe it's just him, sometimes wes cooks nyelak-nyelakne [having taken the time to cook], dee doesn't want to, I dewe wonge nek don't gelem yowes lah, choose gampange, lek arepe iku yowes iku [if you want to eat that then that's it]." (IU6, 28 years old)

This suggests that when a child refuses to eat, some parents tend to give in and follow their child's wishes, choosing foods that are more readily accepted, even if they may not meet recommendations. The family plays a crucial role in this regard. Fathers' involvement in feeding practices can provide a support system for mothers (Quinn et al., 2022).

Mother's knowledge of foods that are good for children's growth

Mothers' knowledge of the importance of nutritious food for children is likely derived from experience, personal perception, and previous educational experiences. Information provided through education has been shown to foster awareness of the benefits of certain types of local foods and other nutritional sources (Choi et al., 2018; Tahreem et al., 2024).

One informant revealed that after receiving education, he became more aware that wader fish and fresh milk have high nutritional value for children.

"Oh, it turns out that waders are also good for children. If you are talking about fresh milk, you know that fresh milk is better than packaged milk. At that time, I had the opportunity to learn about its many benefits." (IU1, 35 years old)

"This good food fulfills all of the following: protein, carbohydrates, vegetables, fruit, and milk..." (IU2, 24 years old)

This statement reflects the informant's awareness of the principles of balanced nutrition, although in practice, she still had to adapt to her child's eating preferences. Changing feeding behavior requires a supportive ecosystem, such as access to food, caregiver time, and family support, to achieve good feeding practices (Kamudoni et al., 2024).

Family access to local food ingredients

The findings of this study indicate that the availability of wader fish as a local source of animal protein varies across regions, despite its reputation as nutritious and affordable local food. An informant from Ngantang District stated that wader fish could be obtained at

markets or from traveling vegetable vendors (mlijo). This is supported by another informant's statement that wader fish are quite easy to find in the Selorejo area, even in raw and cooked forms. However, he also emphasized that sellers rarely carry it unless they order it in advance

"Wader is in the market or in that mlijo" (IU1, 35 years old)

"... onok sing mateng [there's something ripe], sometimes the vegetable seller is there, if you're awake, order ngoten, order first, if you don't order it, rarely come" (IU2, 24 years old)

This statement indicates that, despite its availability, wader fish fluctuates and requires consumer initiative to obtain it. In contrast, informants from Pujon District faced greater difficulties in obtaining wader fish

"Wader fish here are rare, sis, it's difficult here, if you don't go to the place in Selorejo, they don't have any - there aren't any in the stalls" (IU3, 21 years old)

"Wader fish are rare, sis" (IU6, 28 years old)

This shows that the availability of wader fish depends on geographical location, informal distribution channels (such as traveling vegetable sellers), and the ordering system, which are limiting factors in its optimal use as a source of animal protein in family consumption patterns.

Regarding access to fresh milk, research results indicate that the availability of fresh milk in the study area is quite good, especially in the Pujon and Ngantang sub-districts, which are known as dairy farming centers. However, despite the abundant supply and easy access to fresh milk, its utilization is not optimal in this region. This is due to various factors, including consumption habits, children's preferences, and limited household processing practices.

"I have my own milk, I also send it to the collectors" (IU2, 24 years old)

In the Ngantang District, one informant reported that his family owned dairy cows and delivered milk to collectors. This indicates that fresh milk is not only available for household consumption but also serves as a local economic commodity.

Meanwhile, in the Pujon District, several informants confirmed that access to fresh milk was very easy. This is because Pujon is a center for fresh milk production, and its favorable geographical location provides an advantage in terms of fresh milk production and distribution.

"Fresh milk is very easy to get, Miss. Pujon is a dairy farm. You can find it at the cooperative farm. The raw materials are always available, in abundance." (IU5, 26 years old)

"My aunt has a cow milker. I've tried asking for it, and sometimes she gives it to me." (IU4, 36 years old

Other informants also mentioned that access to fresh milk can be obtained informally, for example, from family members who own dairy cows. This suggests that the fresh milk distribution system in the community is flexible and based on social relationships, and is not always dependent on the formal market.

Family food preferences

Children's eating patterns were found to be heavily influenced by the eating habits and preferences of their families, including parents and other family members at home. Regarding vegetable consumption, several informants reported that they rarely served vegetables to their children because they rarely cooked for them. Furthermore, informants cited time constraints and a preference for convenience foods like fried foods for breakfast

"...it's true that I rarely give them vegetables because I rarely cook them, I cook them but sometimes my kids don't want them...to be honest, I don't pay enough attention to vegetables because sometimes I cook things that they might like but the kids don't want them...and I also cook more fried things for breakfast, and then I have soup at lunch..." (IU1, 35 years old)

Fish and seafood intake is also influenced by the health of family members. Furthermore, children's preferences influence cooking decisions. Ultimately, mothers tend to choose foods that are acceptable to all family members, resulting in a lack of variety in their children's diets (Kähkönen et al., 2021).

"Moms and dads, we do not eat chickens and fish, because shrimp should be limited, and fish should also be limited. Yes, because there are some foods that are limited because I was hospitalized because of cholesterol, so we eat more of those foods." (IU1, 35 years old)

The consumption of local fish, such as waders, also faces a similar situation. Although some informants expressed a liking for wader, its use remains limited because not all family members enjoy it and because of its uncertain availability in the market.

"The wader fish in the family is high, sometimes they eat it, sometimes they buy it dead" (IU2, 24 years old)

"I would like wader fish, sis, but I never eat it because there aren't any in the stalls [shops], sis" (IU3, 21 years old)

Some families enjoy fresh milk and consume it irregularly. This depends on the availability and preference at the time. When fresh milk is available, family members consume it by boiling it with a little added sugar.

"Fresh milk is usually not consumed by my family. I like it but I don't have it, but if I do have it, I drink it." (IU4, 36 years old)

Negative perception of local food ingredients (wader, milk)

Research has found that parental risk perception and concerns about the negative effects of certain foods are barriers to implementing LBB-NG in children. Although some foods are readily available and known to be nutritious, concerns about choking hazards, allergies, or digestive issues make mothers hesitant to provide them

"I'm dewe [myself] maem, sometimes I'm tired [affected by] durine lek, I don't chew until it's alus [until it's smooth], makae wedi ngekekno [afraid to give] nang adek" (IU2, 24 years old)

Based on this statement, the uncomfortable experience of fish bones made the informant fear that her child would experience something similar, even though it had never happened to her personally. This reflects how mothers' personal experiences significantly influence feeding decisions, especially regarding foods perceived as having physical risks, such as bones in small fish.

"If I drink fresh milk, I'm afraid of what's called an allergy, Miss, I'm afraid of that, but actually, it's possible, Miss... but if I drink cow's milk, I'm afraid of diarrhea or something, but I've never had it before." (IU5, 26 years old)

A similar situation was observed for fresh milk consumption. One informant expressed concern about potential allergies or diarrhea if her child consumed fresh milk, even though this had never occurred before. This indicates doubt and stems from personal assumptions rather than direct experiences. This illustrates anxieties based on perception, not fact, that can hinder the introduction of highly nutritious foods to children.

Diarrhea after consuming milk requires further identification to determine whether it is due to lactose intolerance or the child's allergy to cow milk (Darma et al., 2024). Milk is a food ingredient that contains allergens. However, the processing of raw milk must also be considered to prevent diarrhea in children (Medemblik et al., 2024; Silveira et al., 2023).

Theme 3: Barriers to Implementing LBB-NG

Difficulty eating in children

One of the key findings of this study was that children's food refusal was a dominant barrier to implementing the LBB-NG. Information from informants indicated that although parents attempted to meet their children's nutritional needs according to the guidelines, refusal, picky eating, and digestive disorders could hinder this and remain a challenge.

"The obstacle is that the child does not want to eat complementary food for breast milk, from the beginning, the baby only eats it twice, the child rarely wants to eat it three times... even though I keep trying three times, sometimes the baby does not want to eat the side dishes, sometimes it is hard not to eat rice, but I do not stop eating noodles with eggs, Promina noodles. Sometimes the child doesn't want to eat the mother, dots." (IU2, 24 years old)

When a child has difficulty eating, such as preferring side dishes and refusing rice, mothers substitute other foods, such as commercial complementary foods. This demonstrates that mothers often compromise when their child refuses staple foods, even though these choices don't always align with the principles of balanced nutrition

"Barriers to digestive problems arek e iku lo, anake lek constipation dadi GTM, canker sores also don't want to eat for almost a week or two" (IU2, 24 years)

"The challenge is that the child doesn't want it" (IU4, 36 years old)

Physiological challenges, such as digestive disorders, exacerbate feeding challenges. Informants reported that their children experienced constipation, which led to closed-mouth movements and even mouth ulcers that caused them to refuse food for extended periods. This demonstrates that children's health conditions, particularly those related to the digestive system, directly impact eating behavior and the success of meeting nutritional needs (Kadim et al., 2024).

Limited time to prepare food

The findings of this study indicate that limited time for parents, especially mothers, is a major

inhibiting factor in optimal child feeding practices, including preparing nutritious meals and implementing a balanced diet based on local food. Informants revealed that domestic and economic activities and responsibilities consume time and energy, leading to rushed cooking and feeding.

"I'm more concerned about my time, sorry sis, I also have responsibilities, sometimes I go to my mother, and sometimes I go to the shop, so I really do the cooking when I'm in the set, sometimes I do the cooking, my dad, I'm not very painstaking" (IU1, 35 years old)

This statement reflects the limited time available for planning, selecting food ingredients, and assisting children while eating. In this context, the mother's lack of direct involvement in the mealtime process (for example, because the father must take over) also contributes to a lack of diligence in developing children's eating habits.

"From time to time, sometimes I haven't had time to kick it... to the field from morning until 12 o'clock..." (IU4, 36 years old)

Another informant echoed this sentiment, stating that working in the fields from morning to noon meant they did not have time to prepare specific meals. Mothers' time-consuming work (especially in the agricultural sector) reduced the diversity and frequency of children's meals, while the inconsistent involvement of fathers and grandparents often weakened the consistency of dietary patterns in children. Therefore, nutritional interventions must involve all family members, not just the mother (Kamudoni et al., 2024; Nurokhmah et al., 2022).

Lack of understanding of how to process and utilize wader and milk as local food

In this study, it was found that mothers did not feel confident in processing and serving wader fish safely according to their children's needs.

"I do not eat wader fish, I have only tried it once, because I do not know how to give it, I only buy it for myself and the people at home... I don't dare give it to you, sis, I really can't give it to my son" (IU1, 35 years old)

The informants expressed hesitation in giving wader fish to their children because they did not know how to process it. This indicates a gap in processing skills despite the willingness and access to the ingredients.

"I haven't been able to apply the wader fish, because the wader fish is fried, it's sometimes too big, the fish is too big, except the wader fish is too soft, the wader fish doesn't have any thorns" (IU2, 24 years old)

Another informant added that the method of processing wader fish is considered unsuitable for children because of its tough and risky texture. This suggests that mothers' concerns about texture and bones stem from their limited knowledge of appropriate processing methods for children, such as steaming, removing bones, or finely chopping food (Palupi et al., 2025). In their research, they developed a wader fish and red bean steamed product as a supplementary food. The results showed good hedonic acceptance by the panelists (Palupi et al., 2025).

"Fresh milk, you're confused about how to process it." (IU3, 21 years old)

The study found that ignorance of the processing process applies not only to wader fish but also to fresh milk, which has great potential in supporting children's growth.

Theme 4: Parental Strategies for Increasing Children's Intake

Preparing a Varied Menu

The findings of this study indicate that mothers take the initiative in processing animal protein sources into foods that are more palatable to their children as a strategy to overcome aversions to the taste, aroma, or original form of the food. These adjustments are made to ensure that children continue to receive nutritional intake without experiencing food aversion.

"...Animal protein, if chicken, sometimes I don't make it into siomay, but if koyok fish, mackerel, I don't make it into nuggets, I don't make it into nuggets straight away, because it's fishy, sis, half a kilo of mackerel takes about 3 days to make... sometimes egg protein doesn't make it into pudding with coconut milk" (IU2, 24 years old)

Several informants described transforming animal protein into more child-friendly forms, such as chicken into dumplings, meatballs, and nuggets, and mackerel into homemade nuggets for their children. Egg protein is also processed into coconut milk pudding, which is another way to diversify feeding options.

"If it is fishy, add lime to remove the fishy smell, then steam it. If it's fried, it's easy to stir; it just needs gravy, Sis... I give the fish yellow spices, sauté brambang onions, just give it gravy, I don't fry it first, it just wants gravy." (IU3, 21 years old)

Other participants demonstrated similar adjustment efforts, but with a greater focus on eliminating fishy odors and preparing food that was child-friendly. It was apparent that mothers were also paying attention to cooking methods that not only catered to children's tastes but also considered health implications, such as preventing cough from oily foods.

Protein as a snack: small portions but often

This study found that some mothers implemented a strategy of providing food in the form of small but frequent portions as an alternative to the ideal three main meals a day pattern.

"It's not given at one meal, right? It ends up being given at snack time, small portions but often... like tofu and tempeh not with rice, but at snack time" (IU5, 26 years old)

This demonstrates flexibility in feeding, with mothers attempting to circumvent their children's refusal of main meals by including protein in snacks or between meals. Although foods like tofu and tempeh are commonly consumed with rice, informants explained that these foods are served separately outside of main mealtimes

Babies and children aged 6–24 months have a relatively small stomach capacity; therefore, they need a strategy of providing food in the form of small but frequent portions to meet their energy and nutritional needs (Harrison et al., 2023). The WHO (2023) recommends a minimum frequency of providing complementary foods of 2–3 times per day for infants aged 6–8 months and 3–4 times per day for children aged 9–23 months who are still breastfed, plus 1–2 snacks as needed (WHO, 2023). For children who are not breastfed, this frequency should be increased to four to five times per day. This strategy helps optimize energy and nutrient intake without overloading the child's stomach (Gu et al., 2025).

This study had several limitations. The relatively small number of informants may not fully represent mothers' experiences in implementing the LBB-NG. Furthermore, the qualitative approach used in this study provided exploratory and descriptive information without quantifying the data. Therefore, future research should use a larger sample size and a quantitative approach to describe eating patterns. Direct observation could also be conducted to obtain a more comprehensive picture of the factors influencing the successful implementation of LBB-NG in children aged 6-24 months

Conclusion

This study examines the implementation, supporting factors, inhibiting factors, and practical strategies of mothers in implementing LBB-NG to meet the nutritional needs of stunted children in Malang Regency, Indonesia. Based on this analysis, the general implementation of these guidelines remains suboptimal. Although mothers are highly motivated and knowledgeable about balanced nutrition, implementation is still hampered by time constraints, unfamiliarity with how to process local ingredients such as Wader fish and fresh milk, and children's eating preferences and responses. The findings also indicate a dominant consumption of animal protein from eggs and chicken, while wader fish consumption is low due to concerns about bones and taste of the fish. Vegetable and fruit consumption varies depending on children's preferences and family habits. In addition, factors such as access to local food, perceived risks of food ingredients, and family roles influence feeding practices.

These findings can be integrated into public health programs by developing visual education modules and practical training for mothers of toddlers on portion sizes, balanced menu combinations, and child-friendly food processing techniques while considering regional characteristics. Further research is recommended to explore the effectiveness of community-based educational interventions in improving understanding and skills related to local food processing. Cross-sectoral engagement, such as with health and food security agencies, needs to be strengthened to ensure sustainable availability and distribution of local food.

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