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# HOUSEHOLD FOOD INSECURITY AND FOOD UTILIZATION WITH STUNTING AMONG CHILDREN AGED 24–59 MONTHS IN LEMBANG HEALTH CENTER, MAJENE

*Kerawanan pangan rumah tangga dan pemanfaatan pangan kaitannya dengan stunting pada anak usia 24 -59 bulan di Puskesmas Lembang, Majene*

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## ABSTRACT

Household food insecurity and inadequate food utilization may contribute to impaired growth and stunting among children. This study aimed to determine the relationship between household food insecurity, food utilization, and stunting among children aged 24–59 months in the working area of Lembang Health Center, Majene. This study employed an analytical observational design with a cross-sectional approach and was conducted in May 2025. The study population comprised children aged 24–59 months in the working area of Lembang Health Center, with 92 subjects selected using stratified random sampling. Household food insecurity was assessed using a questionnaire based on the Household Food Insecurity Access Scale (HFIAS), while food utilization was assessed using a structured questionnaire. Children's height was measured using a microtoise and converted into height-for-age Z-scores based on WHO standards. Data were analyzed using the Chi-Square test or Fisher's exact test, as appropriate. The results showed that household food insecurity was significantly associated with stunting (p = 0.001), and food utilization was also significantly associated with stunting (p = 0.002). These findings indicate an association between household food insecurity, food utilization, and stunting among children aged 24–59 months. The findings highlight the importance of considering household food access and food utilization practices in community-based stunting prevention efforts.

Keywords: Household Food Insecurity, Food Utilization, Stunting, Children Aged 24–59 Months

## *ABSTRAK*

*Kerawanan pangan rumah tangga dan pemanfaatan pangan yang tidak memadai dapat berkontribusi terhadap gangguan pertumbuhan dan stunting pada anak. Penelitian ini bertujuan untuk mengetahui hubungan antara kerawanan pangan rumah tangga, pemanfaatan pangan, dan stunting pada anak usia 24–59 bulan di wilayah kerja Puskesmas Lembang, Majene. Penelitian ini menggunakan desain observasional analitik dengan pendekatan potong lintang yang dilaksanakan pada Mei 2025. Populasi penelitian adalah anak usia 24–59 bulan di wilayah kerja Puskesmas Lembang, dengan 92 subjek yang dipilih menggunakan teknik* stratified random sampling*. Kerawanan pangan rumah tangga diukur menggunakan kuesioner berdasarkan* Household Food Insecurity Access Scale *(HFIAS), sedangkan pemanfaatan pangan diukur menggunakan kuesioner*

*terstruktur. Tinggi badan anak diukur menggunakan mikrotoise dan dikonversi menjadi nilai* height-for-age Z-score *berdasarkan standar WHO. Data dianalisis menggunakan uji Chi-Square atau Fisher's exact test sesuai dengan karakteristik data. Hasil penelitian menunjukkan bahwa kerawanan pangan rumah tangga berhubungan secara signifikan dengan stunting (p = 0,001), dan pemanfaatan pangan juga berhubungan secara signifikan dengan stunting (p = 0,002). Temuan ini menunjukkan adanya hubungan antara kerawanan pangan rumah tangga dan pemanfaatan pangan dengan stunting pada anak usia 24–59 bulan. Temuan tersebut menegaskan pentingnya mempertimbangkan akses pangan rumah tangga dan praktik pemanfaatan pangan dalam upaya pencegahan stunting berbasis masyarakat.*

*Kata kunci: Kerawanan Pangan Rumah Tangga, Pemanfaatan Pangan, Stunting, Anak Usia 24–59 Bulan*

## INTRODUCTION

Food security remains an important public health issue because access to sufficient, safe, and nutritious food is closely related to household nutritional well-being. The 2024 Global Report on Food Crises reported that nearly 282 million people across 59 countries and territories experienced acute food insecurity requiring urgent food and livelihood assistance. Climate variability, including extreme rainfall and drought, may disrupt food production and affect food access, particularly among vulnerable households (GRFC, 2024).

In Indonesia, food security remains an important policy priority. Efforts have focused on improving food availability and access to nutritious foods, maintaining food price stability, and strengthening household food resilience. However, unequal food distribution, household purchasing power, and agricultural constraints remain challenges. At the household level, food security encompasses food availability, access, utilization, and stability, which are important dimensions of nutritional well-being (FAO et al., 2020; UNICEF Indonesia, 2020). Household food insecurity may arise when households have limited or uncertain access to adequate food and may subsequently affect the quantity and quality of foods available for household consumption.

Majene Regency in West Sulawesi continues to face nutritional challenges. The National Food Agency reported a food security index score of 65.8 for Majene in 2024, categorized as moderately food secure, while local health data have indicated a substantial burden of stunting (Badan Pangan Nasional, 2024; Dinas Kesehatan Majene, 2025). This local context highlights the importance of examining household food insecurity and food utilization in relation to child nutritional status, particularly among children aged 24–59 months.

Stunting is characterized by impaired linear growth and may reflect prolonged nutritional inadequacy and the interaction of biological, environmental, socioeconomic, and caregiving factors. In Indonesia, the 2023 Indonesian Health Survey reported a national stunting prevalence of 21.5%, while West Sulawesi remained among the provinces with a relatively high prevalence (Survei Kesehatan Indonesia, 2023). Evidence from Indonesia

indicates that stunting is associated with multiple factors, including child and maternal characteristics, household conditions, food-related factors, sanitation, and other environmental determinants (Gusnedi et al., 2023). Therefore, understanding stunting requires consideration of household food conditions within a broader nutritional and public health context.

Household food insecurity has been identified as a potential factor associated with child nutritional problems. A systematic review conducted in Indonesia reported that household food insecurity was associated with stunting among children under five years of age (Dewi et al., 2024). However, evidence from different populations has not been entirely consistent. A systematic review and meta-analysis of cohort studies found that most individual studies reported a positive association between household food insecurity and stunting, but the pooled analysis did not demonstrate a statistically significant association, with substantial heterogeneity across studies (Patriota et al., 2024). These findings suggest that household food insecurity may be related to child growth but should be considered together with other factors affecting nutritional status.

Household food insecurity may be related to child growth through reduced access to diverse and nutrient-dense foods. When household resources are limited, families may experience restrictions in the variety and quality of foods provided to children, potentially resulting in inadequate nutrient intake. Evidence from Asian countries indicates that household food insecurity and poor dietary diversity are associated with stunting among children under five. Socioeconomic conditions, maternal education, and access to clean water may also contribute to differences in child nutritional outcomes (Islam et al., 2025).

Food utilization is another important dimension of household food security because food availability and access do not necessarily ensure adequate nutritional intake. Food utilization involves the selection, preparation, distribution, and consumption of food to meet nutritional needs. Appropriate utilization includes adequate dietary diversity, appropriate feeding practices, safe food preparation, and adequate water, sanitation, and hygiene. Dietary diversity is particularly important for meeting children's nutritional requirements, and the World Health Organization recommends a diverse diet containing nutrient-dense food groups for young children (WHO, 2023).

Evidence from Indonesia also highlights the importance of appropriate food utilization practices. Yunitasari et al. (2022) reported that complementary feeding practices among Indonesian children aged 6–23 months were not optimal, particularly in terms of minimum dietary diversity and minimum acceptable diet. Samosir et al. (2023) further found that food consumption diversity was significantly associated with nutritional status among Indonesian children aged 6–23 months. These findings suggest that the quality and diversity of food consumption may be relevant to children's nutritional status.

However, evidence regarding the relationship between food utilization and child nutritional status remains inconsistent. Ulfa and Lestari (2021) reported an association between household food utilization and stunting, whereas Nugroho (2017) found no significant relationship between household food utilization and child nutritional status. Other studies have also highlighted the relevance of dietary diversity, household socioeconomic conditions, feeding practices, and access to health services to children's nutritional status (Faisal et al., 2022; Putri & Rokhaidah, 2023; Raraawi et al., 2024; Pebrianti & Nurkhopipah, 2023). These differences suggest that the relationship between household food conditions, food utilization, and stunting may vary across populations and local contexts.

Despite previous studies examining household food security, food utilization, and stunting, evidence regarding their relationships remains inconsistent, particularly across different local settings. Moreover, household food insecurity and food utilization represent distinct dimensions of household food conditions and may have different relationships with child nutritional status. Evidence regarding these relationships in Majene Regency, particularly among children aged 24–59 months in the working area of Lembang Health Center, remains limited. Therefore, further investigation is needed to examine the relationship between household food insecurity, food utilization, and stunting in this local context.

Based on these considerations, this study aimed to analyze the relationship between household food insecurity and food utilization with stunting among children aged 24–59 months in the working area of Lembang Health Center, Majene.

## METHODS

### Study Design, Setting, and Subjects

This study employed a quantitative analytical observational design with a cross-sectional approach and was conducted in the working area of Lembang Health Center, Banggae Timur District, Majene Regency, West Sulawesi, Indonesia, in May 2025. The study population comprised 477 children aged 24–59 months based on January 2025 population data. The inclusion criteria were mothers with children aged 24–59 months who were willing to participate and provide informed consent, and children who had resided in the study area for more than six months. Children with genetic disorders or chronic diseases affecting growth and mothers who were unwilling to provide the required data were excluded.

### Sample Size and Sampling

The sample size was determined using Slovin's formula with a 10% margin of error, yielding 83 subjects. After adjustment for a 10% anticipated dropout rate, the required sample size was 92 subjects. Subjects were selected using stratified random sampling based on residential area and nutritional status. The 92 subjects were first proportionally allocated across four residential areas: Baurung (203 children; 39 participants), Labuang

(155; 30), Lembang (100; 19), and Tande Timur (19; 4). Within each residential stratum, subjects were further proportionally allocated according to nutritional status (stunted and non-stunted): Baurung (17 and 22), Labuang (7 and 23), Lembang (9 and 10), and Tande Timur (2 and 2), respectively. Eligible subjects were then randomly selected within each stratum.

### Data Collection and Measurement

Data were collected through structured interviews, observation, and anthropometric measurements. Household food insecurity was assessed using the Household Food Insecurity Access Scale (HFIAS, 2007) and classified as food secure, mild food insecurity, moderate food insecurity, or severe food insecurity. Food utilization was assessed using a 10-item questionnaire based on Faiqoh (2018), with total scores categorized as poor (10–16), adequate (17–23), or good (24–30). Child height was measured using a microtoise to determine height-for-age Z-score (HAZ) based on the WHO Child Growth Standards. Children with HAZ <−2 SD were classified as stunted, while those with HAZ ≥−2 SD were classified as non-stunted.

### Validity, Reliability, and Statistical Analysis

The validity of the questionnaire was assessed using Pearson Product–Moment correlation, with items considered valid when the r-count exceeded the r-table value. Reliability was assessed using Cronbach's alpha, with a coefficient of ≥0.70 considered acceptable. Data were processed through editing, scoring, coding, entry, and cleaning. Descriptive statistics were used to summarize participant characteristics and study variables. The Chi-square test was used to examine the relationship between household food insecurity and stunting and between food utilization and stunting, with statistical significance set at $p<0.05$.

### Research Permission and Ethical Considerations

Research permission was obtained from the Department of Investment and One-Stop Integrated Services (DPMPTSP) of Majene Regency under permit number 500.16.7.2/185/IV/2025, issued on April 16, 2025. Subjects was voluntary, informed consent was obtained from the mothers or guardians, and the confidentiality and privacy of participants were maintained throughout the study.

## RESULTS

Table 1 showed that a total of 92 children aged 24–59 months participated in the study. The largest age group was 24–35 months (44.6%), and girls accounted for 52.2% of the sample. Most mothers had completed senior high school or equivalent education (50.0%), while the most common occupation of the household head was self-employment (39.1%).

**Table 1.**
**Characteristics of study participants**

| Characteristic | n | % |
|---|---|---|
| **Age** | | |
| 24–35 months | 41 | 44.6 |
| 36–47 months | 20 | 21.7 |
| 48–59 months | 31 | 33.7 |
| **Gender** | | |
| Male | 44 | 47.8 |
| Female | 48 | 52.2 |
| **Mother's education** | | |
| Primary school | 11 | 12.0 |
| Junior high school | 29 | 31.5 |
| Senior high school/equivalent | 46 | 50.0 |
| Bachelor's degree | 6 | 6.5 |
| **Household head occupation** | | |
| Farmer | 10 | 10.9 |
| Fisherman | 34 | 37.0 |
| Self-employed | 36 | 39.1 |
| Teacher | 7 | 7.6 |
| Driver | 5 | 5.4 |
| **Total** | 92 | 100.0 |

**Table 2.**
**Relationship between household food insecurity and stunting among children aged 24–59 Months**

| Household food insecurity | Stunted n (%) | Normal n (%) | Total n (%) | p |
|---|---|---|---|---|
| Food secure | 9 (22.0) | 32 (78.0) | 41 (100.0) | **0.001*** |
| Mild food insecurity | 5 (45.5) | 6 (54.5) | 11 (100.0) | |
| Moderate food insecurity | 4 (30.8) | 9 (69.2) | 13 (100.0) | |
| Severe food insecurity | 19 (70.4) | 8 (29.6) | 27 (100.0) | |
| **Total** | **37 (40.2)** | **55 (59.8)** | **92 (100.0)** | |

Note:
*Chi-Square test, significant if p-value < 0.05

**Table 3.**
**Relationship between food utilization and stunting among children aged 24–59 months**

| Food utilization | Stunted n (%) | Normal n (%) | Total n (%) | p |
|---|---|---|---|---|
| Good | 15 (26.8) | 41 (73.2) | 56 (100.0) | **0.002*** |
| Adequate | 17 (56.7) | 13 (43.3) | 30 (100.0) | |
| Poor | 5 (83.3) | 1 (16.7) | 6 (100.0) | |
| **Total** | **37 (40.2)** | **55 (59.8)** | **92 (100.0)** | |

Note:
*Fisher's exact test; $p < 0.05$ was considered statistically significant

Table 2 showed household food insecurity was categorized as food secure in 41 households (44.6%), mild food insecurity in 11 households (12.0%), moderate food insecurity in 13 households (14.1%), and severe food

insecurity in 27 households (29.3%). Overall, 37 children (40.2%) were stunted and 55 children (59.8%) had normal height-for-age status. As shown in Table 2, stunting was observed in 9 children (22.0%) from food-secure households, 5 (45.5%) from households with mild food insecurity, 4 (30.8%) from households with moderate food insecurity, and 19 (70.4%) from households with severe food insecurity. The Chi-square test showed a significant association between household food insecurity and stunting (p = 0.001).

Table 3 showed that food utilization was significantly associated with stunting among children aged 24–59 months (Fisher's exact test, p = 0.002). The proportion of stunting was highest among children with poor food utilization (83.3%), followed by those with adequate (56.7%) and good food utilization (26.8%).

## DISCUSSION

The findings showed a significant association between household food insecurity and stunting among children aged 24–59 months. In this study, severe food insecurity was identified in 27 households (29.3%), and 19 children from these households were stunted. The proportion of stunting was higher among children living in households with severe food insecurity (70.4%) than among those from food-secure households (22.0%). This finding is consistent with evidence from Indonesia showing that household food insecurity is associated with a higher risk of stunting among children under five years of age (Dewi et al., 2024). The finding is also supported by a systematic review by Lye et al. (2023), which reported a significant association between household food insecurity and childhood undernutrition, particularly stunting and underweight.

Household food insecurity may be related to child growth through inadequate and unstable access to sufficient and nutritious foods. Limited household food resources may restrict the quantity, quality, and diversity of foods consumed by children. Evidence from studies in Asia indicates that household food insecurity and poor dietary diversity are associated with stunting among children under five (Islam et al., 2025). Findings from Indonesia also indicate that food consumption diversity is associated with children's nutritional status (Samosir et al., 2023).

The observed association should nevertheless be interpreted cautiously. A recent systematic review and meta-analysis of cohort studies found that although most individual studies reported a positive association between household food insecurity and stunting, the pooled analysis did not demonstrate a statistically significant association, with substantial heterogeneity across studies (Patriota et al., 2024). This evidence suggests that household food insecurity alone may not fully explain impaired linear growth and that other contextual and individual factors should also be considered.

The multifactorial nature of stunting is also supported by evidence from Indonesia. A systematic review and meta-analysis identified food insecurity, unimproved drinking water, and unimproved sanitation among

household and community factors associated with stunting, while maternal and child characteristics were also associated with stunting (Gusnedi et al., 2023). In addition, parental stature has been associated with stunting among Indonesian children, although substantial heterogeneity and differences in study quality warrant cautious interpretation (Amriviana et al., 2023).

Therefore, the finding that some children from severely food-insecure households were not stunted, while some children from food-secure households were stunted, is plausible. This pattern suggests that household food insecurity should be considered as one component within a broader set of factors associated with child growth. Maternal and caregiver characteristics, feeding practices, dietary intake, infections, sanitation, environmental conditions, socioeconomic circumstances, and access to health services may contribute to differences in nutritional status. Evidence from Southeast Asia similarly indicates that child and parental characteristics, food intake, child health, feeding practices, access to health services, environmental and household conditions, and socioeconomic factors are associated with stunting (Azriani et al., 2024).

The study found a significant association between food utilization and stunting among children aged 24–59 months (Fisher's exact test, $p = 0.002$). The proportion of stunting was highest among children with poor food utilization (83.3%), followed by those with adequate (56.7%) and good food utilization (26.8%). This finding suggests that differences in household food utilization practices may be associated with differences in children's nutritional status.

Food utilization is an important component of household food security because food availability and access do not necessarily ensure adequate nutritional intake. Food selection, dietary diversity, meal frequency, food preparation, and feeding practices may influence the extent to which children receive adequate nutrients. The World Health Organization emphasizes the importance of providing adequate, diverse, and safe foods and applying appropriate feeding practices according to children's nutritional needs and developmental stage (WHO, 2023). Although the WHO guideline specifically addresses complementary feeding among children aged 6–23 months, its principles regarding dietary diversity, food safety, and appropriate feeding practices provide relevant context for understanding food utilization and child nutrition.

However, this finding should not be interpreted as evidence that poor food utilization causes stunting. The cross-sectional design does not establish temporal sequence or causality. In addition, 15 children with good food utilization were still classified as stunted, indicating that food utilization alone may not fully explain differences in linear growth. Stunting is a multifactorial condition involving various individual, household, and environmental factors. Previous evidence from Indonesia has identified household food insecurity, water and sanitation conditions, maternal and

child characteristics, and other contextual factors as being associated with stunting (Gusnedi et al., 2023). Parental stature has also been associated with stunting among Indonesian children (Amriviana et al., 2023). Therefore, the association observed in this study should be interpreted within the broader context of factors that may contribute to child nutritional status.

The relationship between household food conditions, food utilization, and stunting should be interpreted within the broader socioeconomic and environmental context of the household. Evidence from Indonesia indicates that factors associated with stunting may differ according to household socioeconomic status and rural–urban characteristics. Maternal education, maternal stature, sanitation, dietary practices, and access to nutrition services have been associated with differences in stunting prevalence across socioeconomic and residential groups (Widyaningsih et al., 2022).

Environmental conditions may also be relevant to children's nutritional status. Inadequate access to safe drinking water and sanitation may increase exposure to infections and other environmental health risks that can affect child nutrition. A systematic review and meta-analysis in Indonesia identified unimproved drinking water and sanitation, along with household food insecurity and maternal and child characteristics, among factors associated with childhood stunting (Gusnedi et al., 2023). Therefore, efforts to address stunting should consider multiple dimensions of child and household conditions, including food security and food utilization, sanitation and hygiene, access to health and nutrition services, and socioeconomic circumstances.

The findings suggest that stunting prevention in the study area should consider both household food insecurity and food utilization within a broader nutrition and public health framework. Nutrition education may support improvements in dietary diversity, age-appropriate feeding practices, safe food preparation, and the effective utilization of available household foods. These efforts should be complemented by strategies to improve access to nutritious foods, strengthen child growth monitoring and nutrition counselling, and address relevant environmental and socioeconomic conditions. A comprehensive approach that integrates household food conditions, nutrition practices, environmental health, and access to health services may provide a more appropriate framework for stunting prevention in the study area.

This study has several limitations. First, the cross-sectional design does not allow the temporal sequence or causal relationships between household food insecurity, food utilization, and stunting to be established. Therefore, the findings should be interpreted as associations rather than causal effects. Second, the relatively small sample size may have limited the statistical precision of the estimates, particularly for less frequent categories such as poor food utilization. Third, several potential confounding factors, including maternal education, socioeconomic status, parental stature, feeding practices, infectious diseases, sanitation, and access to health services, were not comprehensively assessed or

controlled for in the analysis. Consequently, residual confounding cannot be excluded. Fourth, household food insecurity and food utilization were assessed using self-reported questionnaires, which may have introduced recall or reporting bias. Finally, the study was conducted in the working area of a single health center, which may limit the generalizability of the findings to other populations and geographical settings.

## CONCLUSION

Household food insecurity and food utilization were significantly associated with stunting among children aged 24–59 months in the working area of Lembang Health Center, Majene. These findings highlight the relevance of household food conditions and food utilization practices in stunting prevention efforts. However, given the cross-sectional design, the observed associations should not be interpreted as causal relationships.


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## CONFLICT OF INTEREST

The authors declare no conflicts of interest to disclose.

## DECLARATION USE AI

The authors declare that generative AI tools were used only for language editing and grammar correction. The authors remain fully responsible for the content and integrity of the manuscript.

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