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ANALYSIS OF FEEDING PRACTICS IN STUNTED TODDLERS WITH A HISTORY OF MALARIA

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ABSTRACT

This study aims to analyze feeding practices in stunted toddlers with a history of malaria. The research method used in this study was a quantitative method with a cross-sectional design. Based on the results, it was found that infant and young child feeding (IYCF) practices showed that 61.8% had adequate practices, 32.4% had inappropriate feeding frequencies (<3 main meals + 2 snacks per day), 91.2% had portion sizes that did not comply with guidelines, all respondents had an invariable consumption pattern, and 79.4% of respondents consumed food four days a week or more. In conclusion, feeding practices for stunted children with a history of malaria remain inappropriate.

Keywords: Malaria, Feeding Practices, Stunting

INTRODUCTION

Stunting remains a serious public health concern in Indonesia. Stunting is a condition of growth failure in children under five years of age due to chronic malnutrition, characterised by height for age below minus two standard deviations (-2 SD) based on the World Health Organisation (WHO) growth curve. According to data from the 2024 Indonesia Nutrition Status Survey (SSGI), the prevalence of stunting in Indonesia reached 19.8%, a decrease from 21.5% in 2023. Although there has been a decrease of 1.7% and the 2024 target of 20.1% has been exceeded, this figure is still relatively high, and Indonesia is striving to achieve the long-term target of 14.2% by 2029 in accordance with the National Medium-Term Development Plan (RPJMN).

Stunted toddlers with a history of malaria face a double challenge in terms of meeting their nutritional needs. On the one hand, they suffer from chronic malnutrition that causes stunting; on the other hand, their history of malaria infection exacerbates their malnutrition and increases their nutritional needs for recovery. Data shows that the majority of malaria patients are toddlers (12.03%), children aged 5-9 years (12.87%), and those of productive age 15-64 years (62.34%). Regions with high malaria endemicity generally also show high prevalence of stunting. Provinces such as Papua, Central Papua, South Papua, and Papua Pegunungan not only have the highest number of malaria cases (369,119 cases out of a total of 418,546 national cases in 2023), but also face serious stunting problems. East Nusa Tenggara (NTT) is also one of the provinces with high malaria and stunting rates, particularly among high-risk groups such as infants. According to research by Tien Popang, 2024, the incidence of malaria among children under five in the Kimi Community Health Centre working area in 2024 was 45 out of 546 targets, or a prevalence rate of 8%. SSGI 2022 data shows a strong correlation between stunting prevalence and malaria elimination.

Feeding practices are one of the important factors that influence the nutritional status of toddlers. Improper feeding patterns are one of the main causes of stunting. Based on the 64th National Nutrition Day in 2024, the Ministry of Health of the Republic of Indonesia promoted the theme 'Animal Protein-Rich Complementary Foods Prevent Stunting' with the slogan 'Quality Complementary Foods for the Golden Generation', emphasising the importance of providing quality complementary foods, especially those rich in animal protein, in preventing stunting. Research shows that improper feeding practices have a significant association with stunting. A study conducted by Oresti & Handiny (2023) found that 68.6% of respondents had improper eating habits, and there was a significant association between feeding patterns and stunting in children aged 12-59 months (p=0.001).

Inappropriate feeding practices encompass several aspects, including feeding frequency, food variety, quantity or portion size, nutritional quality, and food texture: Feeding foods with textures that are not appropriate for the child's chewing ability and age. Animal protein plays a crucial role in child growth because it contains complete and high-quality essential amino acids. Animal protein plays an important role in child growth because it contains complete and high-quality essential amino acids that support the formation of body tissues, including bone matrix by increasing insulin levels. Adequate animal protein consumption has been shown to be associated with a reduced risk of stunting, as shown by research in Indonesia that found animal protein supplementation (milk and eggs) effective in preventing and overcoming stunting in toddlers (Sjarif et al., 2025; Astuti et al., 2025; Haryani et al., 2023). Cross-country data also show that increasing milk consumption is accompanied by a significant reduction in the frequency of stunting, highlighting the importance of dairy products as a source of animal protein in children's nutrition strategies (Haile & Headey, 2023; Ramahaimandimby et al., 2023). However, low animal protein consumption is often caused by economic, cultural, and low nutritional literacy factors, so educational interventions and increased access are key to improving feeding patterns (Tasya et al., 2025; Damayanti et al., 2024). Interventions providing additional animal protein through complementary foods and visual media-based education have also been shown to improve important anthropometric parameters in stunted children, such as waist circumference, which indicates improved nutritional status (Warsini et al., 2025). However, caution is needed in excessively increasing protein intake because several studies have shown the potential negative effects of high protein consumption on linear growth in children and adolescents, so the dosage and quality of protein must be considered (Xiong et al., 2023; Zhou et al., 2021).

Although there have been many studies examining the relationship between malaria and stunting separately, as well as studies on feeding practices in stunted toddlers, there are still limited studies that specifically analyse feeding practices in stunted toddlers with a history of malaria. In fact, this group requires special attention because they face more complex nutritional challenges. A deep understanding of feeding practices among stunted infants with a history of malaria is crucial for several reasons, including specific nutritional needs, appropriate intervention strategies, prevention of complications, and breaking the cycle of malnutrition. This study is expected to provide a comprehensive overview of feeding practices among stunted infants with a history of malaria, identify gaps in feeding practices, and provide recommendations for improving more integrated nutritional interventions. The results of this study are also expected to contribute to efforts to achieve national targets for reducing stunting and eliminating malaria in Indonesia, particularly in endemic areas. By feeding practices among toddlers facing these dual challenges, it is hoped that more effective intervention strategies can be developed, not only in terms of specific nutrition but also

nutrition-sensitive interventions involving various sectors, including malaria vector control, improved environmental sanitation, and family empowerment in optimal feeding practices.

RESEARCH METHOD

This study used a quantitative research design with a cross-sectional approach to determine feeding practices and the incidence of stunting in toddlers with a history of malaria. It was conducted in the working area of the Kimi Community Health Centre in Nabire Regency, Central Papua Province, which covers Kimi Village, Lani Village and Waharia Village, which are malaria-endemic areas with a high prevalence of stunting. The study was conducted over a two-month period, from June to July 2025. The population in this study consisted of all toddlers aged 24-59 months who had a history of malaria in the last 12 months and were registered in the working area of the Kimi Community Health Centre, with a total of 45 toddlers. The sampling technique used was purposive total sampling, which is a technique for determining samples based on certain considerations in accordance with criteria set by the researcher. The instruments used were structured questionnaires for respondent characteristic data, Food Frequency Questionnaires (FFQs), microtoises for measuring height, digital scales for measuring weight, and Mother and Child Health Books (KIA). Data were collected through visits to Posyandu by the Research Team. Anthropometric measurements were carried out according to WHO standards. Food consumption data was collected through interviews with mothers/caregivers using food models and visual aids. The data was analysed using computerised methods.

RESULTS

Table. 1
Characteristic of Respondens

Characteristic	n	%
Sex :		
Men	18	52,9
Women	16	47,1
	34	100
Age :		
12-24 Months	13	38,2
25-60 Months	21	61,8
	34	100
History of Birth Weigh :		
<2500 gr	8	23,5
> 2600 gr	26	76,5
	34	100

Table 1 shows that the results of the study indicate that of the 34 respondents, 18 (52.9%) were male and 16 (47.1%) were female. Thirteen respondents (38.2%) were aged 12-24 months and 21 respondents (61.8%) were aged 25-60 months. Eight respondents (23.5%) had a birth weight history of <2500 grams and 26 respondents (76.5%) had a birth weight history of >25000 grams.

Table. 2
Socio Cultural Characteristics

Socio Cultural	n	%
Educational Level		
SD	2	5,9
SMP sederajat	8	23,5
SMA sederajat	24	70,6
	34	100
Etnic :		
OAP Pegunungan	2	5,9
OAP Pesisir	11	32,4
Non OAP	21	61,9
	34	100
Fammily Income Level :		
<UMR	31	91,2
> = UMR	3	8,8
	34	100

Meanwhile, socio-cultural characteristics show that the educational level of mothers is as follows: 2 people (5.9%) have completed primary school, 8 people (23.5%) have completed junior high school, and 24 people (70.6%) have completed senior high school. Two individuals (5.9%) are from the OAP Pegunungan ethnic group, 11 individuals (32.4%) are from the OAP pesisir ethnic group, and 21 individuals (61.9%) are non-OAP. The heads of households worked as labourers, farmers, ranchers and fishermen (17 people or 50%), private employees and construction workers (15 people or 44.1%) and civil servants (2 people or 5.9%). The family income level was below the Nabire Regency minimum wage of IDR 4,024,000 for 31 people (91.2%) and at or above the minimum wage for 3 people (8.8%).

Table. 3
Feeding Practics

Feeding Practics	n	%
Frequency		
Inappropriate feeding frequency (<3 main meals + 2 snacks per day)	11	32,4
appropriate feeding frequency (3 main meals + 2 snacks per day)	23	67,9
	34	100
Portion Size :		
not align with guidelines	31	91,2
adhered to guidelines	3	8,8
	34	100
consumption patterns		
not varied according to the guidelines or less than 4 food groups per day	34	100
	34	100
Frekwensi Konsumsi Protein Hewani		
animal protein less than 4 days a week	7	20.6
consumed it 4 days a week or more	27	79,4
	34	100
feeding practices categories :		
poor practices	13	38,2
adequate practices	21	61,8
	34	100

Based on the results of the study, it was found that infant and child feeding practices (PMBA) showed that 13 people (38.2%) had poor practices and 21 people (61.8%) had adequate practices. In detail, 11 people (32.4%) had an inappropriate feeding frequency (<3 main meals + 2 snacks per day) and 23 people (67.9%) had an appropriate feeding frequency (3 main meals + 2 snacks per day). Thirty-one individuals (91.2%) had portion sizes that did not align with guidelines, while 3 individuals (8.8%) adhered to guidelines. All respondents had consumption patterns that were not varied according to the guidelines or less than 4 food groups per day. Seven people (20.6%) consumed animal protein less than 4 days a week, and 27 people (79.4%) consumed it 4 days a week or more. This can be seen in Table 3.

DISCUSSION

The results of the study indicate that there are still respondents who have not received adequate feeding practices. This finding is a serious concern given that toddlers with a history of malaria have a double risk of experiencing growth disorders, where inadequate feeding practices can worsen existing stunting conditions. Malaria has a significant impact on children's nutritional status through several mechanisms. Malaria infection increases the body's energy and nutritional requirements to fight infection, while at the same time causing a decrease in appetite (anorexia), malabsorption of nutrients, and increased loss of nutrients. This condition creates a dangerous cycle when feeding practices are inadequate, as children do not get enough nutrients to meet their recovery and growth needs.

Malaria significantly impacts children's nutritional status by increasing the risk of stunting, underweight, and other forms of malnutrition, as infected children often experience higher energy and nutrient demands alongside reduced appetite and nutrient absorption (Hhera et al., 2025; Uwimana et al., 2025; Keita et al., 2024). Studies in Tanzania and Rwanda show that children with malaria have substantially higher odds of stunting and underweight compared to uninfected peers, with socioeconomic factors also influencing nutritional outcomes (Hhera et al., 2025; Uwimana et al., 2025). Malaria infection is associated with elevated inflammatory markers and altered micronutrient biomarker levels, such as increased ferritin and decreased iron, zinc, and vitamin D, which complicate nutritional assessments and contribute to anemia and malnutrition (Sandalinas et al., 2025; Al-Sultany et al., 2025). Multiple malaria episodes correlate with worse nutritional status, particularly anemia and underweight, and this relationship is more pronounced during low transmission seasons (Keita et al., 2024). Interventions combining malaria prevention and treatment with nutrition programs are recommended, as malaria control alone shows limited impact on improving nutritional status (Hhera et al., 2025; Grant et al., 2022). Overall, the evidence highlights a complex, bidirectional relationship where malaria worsens nutritional deficiencies, which in turn may increase susceptibility to malaria, underscoring the need for integrated health and nutrition strategies in endemic areas (Uwimana et al., 2025; Ola et al., 2025; Al-Sultany et al., 2025).

The study by Islamiati & Kurniasih (2025) found that stunted toddlers with a history of malaria tend to have low dietary diversity, with only 34.7% achieving MDD, far below the global target of 70%. The portions of food provided often do not meet children's energy and protein needs. According to WHO guidelines (2021), children aged 6-8 months need 200 kcal/day from complementary foods, those aged 9-11 months need 300 kcal/day, and those aged 12-23 months need 550 kcal/day. Research by Miranda et al., (2024) shows that 62% of stunted toddlers with a history of malaria receive food portions that do not meet their daily energy requirements.

Research specifically examining feeding practices in stunted toddlers with a history of malaria is still very limited, even though this group faces more complex nutritional challenges due to the interaction between malaria infection and nutritional status (Maina, 2024). Malaria worsens nutritional status through increased nutritional needs, decreased appetite, and impaired nutrient absorption, so appropriate feeding practices are crucial to prevent complications and improve stunting (Maina, 2024; Prudence et al., 2024). Studies in malaria-endemic areas have shown that providing micronutrient-enriched complementary foods can reduce the risk of anemia in toddlers, which is often a problem in children with a history of malaria, although its effect on stunting has not been directly evaluated (Csölle et al., 2022). Social, economic, and cultural factors strongly influence feeding practices, including meal frequency and dietary diversity, which play a significant role in children's nutritional status (Makwela & Mashaba, 2025; Maina, 2024; Tello et al., 2022). Gaps in feeding practices, such as low meal frequency and lack of dietary diversity, especially in vulnerable groups such as toddlers with a history of malaria and stunting, need to be identified to design more integrated and contextual nutrition interventions (Makwela & Mashaba, 2025; Tello et al., 2022). Therefore, a thorough understanding of feeding practices in this group is crucial to develop effective intervention strategies to break the cycle of malnutrition and improve health. children as a whole (Makwela & Mashaba, 2025; Maina, 2024).

CONCLUSION

TBased on the results of the study, it was found that infant and child feeding practices (PMBA) showed that 13 people (38.2%) had poor practices and 21 people (61.8%) had adequate practices. In detail, 11 people (32.4%) had an inappropriate feeding frequency (<3 main meals + 2 snacks per day) and 23 people (67.9%) had an appropriate feeding frequency (3 main meals + 2 snacks per day). Thirty-one individuals (91.2%) had portion sizes that did not align with guidelines, while 3 individuals (8.8%) adhered to guidelines. All respondents had consumption patterns that were not varied according to the guidelines or less than 4 food groups per day. Seven people (20.6%) consumed animal protein less than 4 days a week, and 27 people (79.4%) consumed it 4 days a week or more. The conclusion of this study is that feeding practices for stunted children with a history of malaria are still inappropriate.

SUGGESTION

Research covering other variables that may affect nutritional status in malaria needs to be conducted, as well as further study of overall nutritional intake..

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