

## Evaluation of Feeding Practices for Infants and Children (PMBA) for Stunting Children in Lombok

Lina Nurbaiti<sup>1,2</sup>, Nurpudji Astuti Taslim<sup>1</sup>, Mochammad Hatta<sup>1</sup> and Agussalim Bukhari<sup>1</sup>

<sup>1</sup>Faculty of Medicine, Hasanuddin University, Makassar, Indonesia

<sup>2</sup>Faculty of Medicine, Mataram University, Mataram, Indonesia

Coressponding Author: [pudji\\_taslim@yahoo.com](mailto:pudji_taslim@yahoo.com)

**Abstract.** West Nusa Tenggara (NTB) is ranked seventh as the province with the highest prevalence of stunting in Indonesia. Feeding Practices for Infants and Children (PMBA) is one of the specific nutritional interventions that can be carried out to prevent and overcome stunting. This study is a cross-sectional study design with structured interviews using a questionnaire to see the characteristics of PMBA in mothers of stunting toddlers aged 6-24 months. The research respondents were 35 mothers of stunting children who were selected using a purposive sampling technique. Feeding age accuracy: 80% age accuracy; 11.4% given earlier than their age, and 8.6% later than their age. Feeding frequency: 77.1% were given 3 times a day; 17.1% were given two meals a day; and 5.8 % were given one meal a day. Amount of food as measured: 25.7% used up and 74.3% remaining. Age-appropriate texture / consistency: 85.7% correct and 14.3% incorrect. Diversity of food: 91.4% non-diverse and 8.6% diverse. Feeding method; 100% fed, using a spoon 25,7% and using hands 74,3%.. Hygiene: 91.4% mothers / caregivers do not wash their hands with soap and only 8.6% wash their hands with soap before feeding their children. Conclusions :The feeding rules for stunting toddlers are still not in accordance with PMBA guidelines.

**Keywords:** PMBA, Stunting, toddlers, evaluation, feeding practices

### 1. Introduction

Stunting is short stature, height or lenght not suitable for age, this is due to insufficient nutritional intake or poor health, in other words, stunting is a problem of failure to thrive.<sup>1</sup> Toddlers are not growing optimally as they should be due to chronic malnutrition.<sup>1,2</sup> The main factor causing the high problem of stunting in Indonesia, one of which is poor nutrition intake since the fetus is still in the womb (pregnancy), newborn, until the child is two years old.<sup>3</sup> Indonesia is included in the third country with the highest prevalence in the Southeast Asia / South-East Asia Regional (SEAR) region, with the average prevalence of stunting under five in Indonesia in 2005-2017 is 36.4%.<sup>4</sup> Based on 2018 Riskesdas data, West Nusa Tenggara (NTB) is in seventh place as the province with the highest prevalence of children under five with stunting in Indonesia.<sup>5</sup> Stunting has an impact not only on length or height, but also on the level of intelligence, susceptibility to disease and decreased productivity.<sup>6,7,8</sup> WHO sets a maximum tolerance limit for stunting of 20% or one-fifth of the total number of children under five.<sup>1</sup> The very high number of stunting cases under five due to chronic nutrition problems in NTB will become a threat if the stunting problem is not resolved because it will affect the quality of human resources. The position of the NTB HDI (Human Development Index) nationally still ranks 30 out of 34 provinces.<sup>5</sup>

Efforts to reduce the number of stunting children under five can be carried out through two interventions, namely specific nutrition interventions to address the direct causes of stunting and sensitive nutrition interventions to address indirect causes.<sup>9</sup> Feeding Infants and Children (PMBA) is one of the specific nutritional interventions that can be done to prevent and dealing with stunting. MPASI is not only related to food availability but also includes the accuracy of age of feeding, frequency of meals, number / portion of food, food texture, type / variety, feeding and hygiene. PMBA aims to improve nutritional and health status, growth and development and survival of children in Indonesia. PMBA is very important for the prevention of stunting, because improper feeding of babies and children can cause other nutritional problems. Therefore, researchers will conduct an evaluation related to the feeding program for infants and children (PMBA) in stunting children in West Lombok, NTB.

## 2. Materials and Methods

This study used a cross sectional study design. Structured interviews used a questionnaire to see the characteristics of infant and child feeding (PMBA) in mothers / caregivers of stunting toddlers aged 6-24 months. Respondents of the study were 35 mothers of stunting infants who were selected using purposive sampling technique. This research was conducted from February to September 2019.

## 3. Results and Discussion

### 3.1. Respondent Characteristics

**Tabel.1 Respondent Characteristics**

Variabel	All	
	n	%
Household Income		
Low (<Rp 1.400.000,00)	16	45,7
Medium (Rp.1.400.000,00- Rp.2.000.000,00)	14	40,0
High (>Rp.1.400.000,00)	5	14,3
Father's Educational Status		
Low ( $\leq$ Elementary School)	3	8,6
Medium (Junior- High School)	30	85,7
High (College / academy)	2	5,7
Mother's Educational Status		
Low ( $\leq$ Elementary School)	25	71,4
Medium (Junior- High School)	10	28,6
High (College / academy)	0	0,0

Most of the parents of stunting children under five have low income (<IDR 1,400,000), the father's education is medium (Junior-High School) and the mother's education is low ( $\leq$  Elementary School). Household income standard based on people's minimum wage standard (UMR) in Central Lombok.

Mothers with low education have an influence on the incidence of stunting in toddlers by 1.67 times compared to mothers with higher education.<sup>10,11,12</sup> Low education of fathers and mothers gives a risk of stunting in toddlers.<sup>13</sup> Several studies have concluded that a mother's educational status will determine the quality of her caregiving. Mothers with higher education will certainly be different from mothers with low education.<sup>14</sup> The level of education will affect food consumption by selecting food ingredients. Higher educated people tend to choose ingredients that are better in quality and quantity of dishes than those with less or moderate education. The higher a person's education level, the better the child's nutritional status.<sup>15</sup>

The low household income factor has an influence on the incidence of stunting in toddlers. Toddlers in low-income households have a risk of experiencing stunting by 2.1 times.<sup>11,15</sup> Low household income was identified as a significant predictor of stunting.<sup>15</sup> This study shows that socioeconomic factors such as low household income are significantly associated with stunting and underweight. The socioeconomic level is related to the purchasing power of the family.<sup>16</sup> The ability of a family to buy food depends on the family income, the price of foodstuffs, and the level of management of land and yard resources. Low income families are likely not able to meet their food needs, especially to meet the nutritional needs of their children.<sup>16,28</sup>

Hygiene and sanitation have an influence on the incidence of stunting in children under five. The incidence of stunting among children under five was more prevalent in households who did not wash their hands using soap compared to those who did.<sup>17</sup> 7.2 million cases of stunting worldwide are caused by poor sanitation.<sup>18</sup> The burden arising from improper sanitation for stunting is greater (although not significant) than diarrhea in childhood, due to some of the effects of sanitation enhanced through infection prevention efforts during infancy and improving maternal health and nutrition in pregnancy. This further underscores the importance of ongoing water, sanitation and hygiene (WASH) programs to improve access to, and use of, clean water and sanitation for children and families worldwide.<sup>18,19</sup>

### 3.2 Description of Feeding For Stunting Toddlers

**Table 2. Description of Feeding for Stunting Toddlers**

Variable	n=35	%
Accuracy of age of feeding		
• Appropriate	28	80,0
• Not appropriate	7	20,0
○ Earlier	4	11,4
○ Slower	3	8,6
Feeding Frequency		
• Once a day	2	5,8

• 2 times a day	6	17,1
• 3 times a day	27	77,1
Amount of Food		
• Finished according to portion	9	25,7
• Left over	26	74,3
Texture / Consistency of Food		
• Appropriate	30	85,7
• Not appropriate	5	14,3
Food diversity		
• Diverse	3	8,6
• Not diverse	32	91,4
Method of Feeding		
• Feeding Food Using a spoon	9	25,7
• Feeding food Using hands	26	74,3
Personal Hygiene		
• Wash Hands Using Soap	3	8,6
• Wash Hands without Soap	32	91,4

### 3.2.1 Accuracy of Feeding Age for Stunting Toddlers

Most of the stunting children under five (80%) were given complementary foods at the right age. This is not in line with a large number of studies which state that there is a significant relationship between the initial age of complementary feeding and the nutritional status of children. The cause of growth disruption is due to the wrong and inappropriate consumption pattern of complementary foods (MP-ASI). The provision of complementary foods before 6 months of age in terms of the development of the digestive system is not ready to receive semi-solid foods and increases the risk of diarrhea. MP-ASI that is not given at the right time and amount can reduce nutritional status.<sup>15,16</sup>

### 3.2.2 Feeding Frequency in Stunting Toddlers

The frequency of eating is the amount of food daily - both qualitative and quantitative.<sup>20</sup> In other words, the quality and quantity of food consumed by toddlers to achieve optimal growth. The frequency of feeding to toddlers in the present will have an effect on the growth process of toddlers in the future.<sup>20,21</sup> The feeding pattern of children must be appropriate for their age to avoid health problems.<sup>22</sup>

In this study, 77.1% of children under five who were stunted from mothers who attended the PMBA class had a frequency of three meals a day. This is in accordance with the PMBA theory in children aged 6-9 months who can be given food + breast milk 2-3 times a day with 1-2 snacks, 9-12 months old can be given 3-4 times meals plus breast milk with 1-2 times a

snack and at the age of 12-24 months can be given 3-4 times a meal plus breast milk and 1-2 times a snack.<sup>20,21</sup> There is a relationship between the frequency of complementary feeding and nutritional status.<sup>21,22,23</sup>

### *3.2.3. Amount of Food in Stunting Toddlers*

Almost all of the amount of food according to age and portion of children under five were left over (74.3%). The amount of leftover food affects the amount of nutritional intake that enters the toddler's body. Children often refuse to finish their food. The response of the leftover food causes the number of food portions to decrease and can have an impact on body weight that does not increase.<sup>20,21</sup> This can be influenced by various factors, one of which is poor parenting. Poor parenting patterns lead to poor nutritional status of children under five. If this occurs during the golden age, it will cause brain damage in toddlers and this condition is irreversible.<sup>23</sup>

One example of feeding care for toddlers is the habit of delaying giving food because they follow their child's wishes and giving food to toddlers without paying attention to their nutritional needs, causing poor quality and quantity of toddler nutrition so that toddlers are prone to stunting.<sup>21</sup> It is important to provide education to mothers who have babies aged 6 months about knowledge of infant and child feeding. In this study, it was not known how much leftovers were given from the food, so the researchers could not accurately determine the number of calories whether it was in accordance with the nutritional adequacy rate according to age.<sup>23,24,25</sup>

### *3.2.4. Accuracy of Stunting Feeding Texture According to Age*

The texture of food given to stunting children was mostly age appropriate (85.7%). The mother of a toddler has a good knowledge of the right food texture according to the age of the toddler. These results are in line with research conducted in Pakistan which states that nutritional counseling for mothers can improve feeding practices, one of which is the texture of feeding.<sup>24</sup> Providing a food texture that is not appropriate for children's age contributes to the risk of incidence of underweight nutrition in children under five.<sup>25</sup>

### *3.2.5. Diversity of Food in Stunting Toddlers*

All respondents consume staple foods, vegetables and animal side dishes at each feeding for toddlers. According to the mother of the toddler, these food ingredients are very easy to get. Although it is very easy to get a variety of vegetable side dishes and fruits, it is not affordable because of the high prices and toddlers do not like these types of food. The mother of a toddler cooks rice and other side dishes once a day, so that the toddler's diet is the same at every meal. The menu in 1 meal, consists of 2 types of food only. The most commonly consumed sources of animal and vegetable protein are eggs and tofu. The lack of diversity in food for children under five has significantly caused stunting. Several studies have shown the

significance between dietary diversity, especially protein sources, and the incidence of stunting.<sup>12,14,15 26</sup>

### *3.2.6. Method of Feeding and Hand Hygiene for Stunting Mother / Caregiver for Toddlers*

The way of feeding was mostly done by hand, which was 74.29%. Feeding by hand can be a risk factor for infection in children under five which will also affect the nutritional status of children.<sup>12</sup> Most mothers of stunting children under five have a habit of not washing their hands before eating using clean water and soap. In fact, PHBS material related to hand hygiene is listed in the PMBA module which is explained to mothers of toddlers.<sup>21,23</sup> In the systematic review conducted, it shows that counseling can improve maternal behavior such as improving hygiene, sanitation, preparation and feeding so that children's growth is better and reduces the risk of malnutrition.<sup>26,27</sup>

## *3.3. Conclusions and Suggestions*

### *3.3.1 Conclusions*

The feeding rules for stunting toddlers are still not in accordance with PMBA guidelines. The age, frequency and texture of the food are appropriate, but the amount, variety and hygiene are still inaccurate.

### *3.3.2. Suggestion*

There is a need for further evaluation of the effectiveness of the nutrition counseling and counseling programs that have been carried out, besides that it is necessary to develop efforts to change parenting behavior through FGD (Forum Group Discussion) activities on both direct targets (foster parents) and indirect targets (Religious leaders, community leaders, cadres, etc.), it is also necessary to optimize the ASHAR program (Action for the First Thousand Days of Life) as a preventive measure for the incidence of stunting which of course also affects the growth of toddlers, especially under-five weight and height.

For the next research, it is necessary to carry out further research on other factors that affect the nutritional status of children under five, especially under five years of age, with an analytical approach so that a significant relationship can be found between the factors studied and the nutritional status of children under five and perhaps also reviewing how functional food affects stunting.<sup>29</sup>

### *Research Limitations*

There are several limitations to this study. The number of respondents in this study was still insufficient and did not compare between the stunting and non-stunting groups. Future research is expected to be able to answer the limitations of this research.

### *Funding:*

This research received internal funding from PNBP Unram.

### *Acknowledgments:*

We would like to express our gratitude to the Head of the Narmada Public Health Center and his staff, and also posyandu cadres in his work area.

### *Conflicts of Interest:*

The authors declare that they have no competing interests.

### **References**

1. WHO. 2010. Nutrition landscape information system (NLIS) country profile indicators: Interpretation guide. Geneva: World Health Organization
2. Ramli, Agho KE, Inder KJ, Bowe SJ, Jacobs J, Dibley MJ. 2009. Prevalence and risk factors for stunting and severe stunting among underfives in north maluku province of Indonesia. Research Article BMC Pediatrics, 9:64
3. Millennium Challenge Account Indonesia. 2015. Stunting and Indonesia's future. [www.mca-indonesia.go.id](http://www.mca-indonesia.go.id)
4. Pakhri, A et al. 2011. Maternal Education, Regular Weighing, Nutritional Intake and Nutritional Status of Children aged 0-24 Months. Media Gizi Pangan, Vol. XI, Ed 1.
5. Ministry of Health RI. 2018. Basic Health Research 2018. Published by BalitbangkesKemenkes RI
6. Hoddinott J, Alderman H, Behrman JR, Haddad L, Horton S .2013. The economic rationale for investing in stunting reduction. university of pennsylvania scholarly commons. Grand Challenges Canada Economic Returns to Mitigating Early Life Risks Project <http://www.cellandbioscience.com/content/3/1/4>
7. World Health Organization .2014. Global nutrition targets 2025 stunting policy brief. Geneva, Switzerland: World Health Organization.
8. RI Ministry of Health. 2016. Indonesia's Health Profile. 2015. Decree of the Minister of Health of the Republic of Indonesia. Jakarta
9. Kemendes PDTT. 2018. Village Handbook in Handling Stunting. Jakarta
10. Rachmi CN, Agho KE, Li M, Baur LA. 2016. Stunting, underweight and overweight in children aged 2.0-4.9 years in Indonesia: Prevalence trends and associated risk factors. PLoS One. 11(5):1-17.
11. Torlesse H, Cronin AA, Sebayang SK, 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. BMC Public Health; 16(1):1-11.
12. Nguyen HT, Eriksson B, Petzold M, Bondjers G, Tran TK, Nguyen LT, et al. 2013. Factors associated with physical growth of children during the first two years of life in rural and urban areas of Vietnam. BMC Pediatr. 13(1):149.
13. Chirande L, Charwe D, Mbwana H, Victor R, Kimboka S, Issaka AI, et al. 2015. Determinants of stunting and severe stunting among under-fives in Tanzania: Evidence from the 2010 cross-sectional household survey. BMC Pediatr. 15(1):1-13.

14. Anindita, P. 2012. The Relationship between Mother's Education Level, Family Income, Protein & Zinc Adequacy with Stunting (Short) in Toddlers Ages 6-35 Months in Tembalang District, Semarang City. *Public Health*, 1, 617-626. Retrieved from <http://ejournals1.undip.ac.id/index.php/jkm>
15. Rajoo Y, Ambu S, Lim YAL, Rajoo K, Tey SC, Lu CW, et al. 2017. Neglected intestinal parasites, malnutrition and associated key factors: A population based cross-sectional study among indigenous communities in sarawak, Malaysia. *PLoS One*. 12(1):1–17.
16. Fikawati S, Syafiq A. 2010. Study of the implementation of Exclusive Breastfeeding and Early Initiation of Breastfeeding Policies in Indonesia. *Health Makara*. 14 (1): 17– 24
17. Ministry of Health of the Republic of Indonesia. 2006. General Guidelines for Local Complementary Feeding (MP - ASI). Jakarta
18. Danaei G, Andrews KG, Sudfeld CR, Fink G, McCoy DC, Peet E, et al. 2016. Risk factors for childhood stunting in 137 developing countries: A comparative risk assessment analysis at global, regional, and country levels. *PLoS Med*. 13(11):1– 18.
19. Djola, R. 2011. The Relationship Between Family Income Level and Parenting Patterns with the Nutritional Status of Toddler Children in Bongkudai Village, West Modayag District. Sam Ratulangi University Faculty of Public Health
20. Ministry of Health of the Republic of Indonesia. 2014. The Counseling Training Module Facilitator Guide: Infant and Child Feeding. Jakarta.
21. Handayani L, Mulasari SA, Nurdianis N. 2008. Evaluation of Infant Supplementary Feeding Program. *Journal of Health Service Management*. 11 (1): 21-26.
22. Suhendri. 2009. Factors that Affect the Nutritional Status of Toddlers. Published by UIN SyarifHidayatullah, Jakarta.
23. Rahmawati SM, et al. 2019. Counseling by Posyandu Cadres to Improve Mother Practices in Feeding Babies and Children aged 6-24 Months in Pagelaran Village, Ciomas District, Bogor, Indonesia. *Indonesian Nutrition*, 42 (1): 11-22. Available from: <<[http://ejournal.persagi.org/index.php/Gizi\\_Indon](http://ejournal.persagi.org/index.php/Gizi_Indon)>>
24. Zaman S, Ashraf R, Martines J. 2008. Training in Complementary Feeding Counselling of Health Care Workers and Its Influence on Maternal Behaviours and Child Growth: A Cluster Randomized Controlled Trial in Lahore, Pakistan. *Journal Health Popular Nutrition*. 26(2):210-222
25. Widyawati, Febry F, Destriatania S. 2016. Analysis of Complementary Feeding with Nutritional Status in Children Aged 12-24 Months in The Work Area of Puskesmas Lesung Batu, EmpatLawang. *Journal of Public Health Sciences*. 7 (2). Available from: <<<https://media.neliti.com/media/publications/58022-ID-analysis-complementary-feeding-and-nutri.pdf>>>
26. Sunguya BF, Poudel KC, Mlunde LB, Shakya P, Urassa DP, Jimba M&Yasuoka J. 2013. Effectiveness of nutrition training of health workers toward improving caregivers' feeding practices for children aged six months to two years: a systematic review. *Nutrition journal*, 12(1): 1-14.
27. Kustiani A, Misa AP. 2018. Changes in Mother's Knowledge, Attitudes, and Behavior in Breastfeeding Children aged 6-24 Months at Nutrition Counseling Interventions in LubukBuaya, Padang City. *Pioneer Health Journal*. 5 (1): 60-66

28. Meliahsari, R. and Taslim, N.A., 2018, June. Association of Nutritional Status with Anemia on Malaria Patient with DihydroartemisininPippperaquine Treatment in Southwest Sumba 2015. In *Proceedings of the International Conference on Healthcare Service Management 2018* (pp. 125-131).
29. Nurkolis, F., Surbakti, F.H., Sabrina, N., Azni, I.N. and Hardinsyah, H., 2020. Mango Sugar Rich in Vitamin C: A Potency for Developing Functional Sugar Rich in Antioxidants. *Current Developments in Nutrition*, 4(Supplement\_2), pp.765-765.