

Article

The Influence of Nutrition and Health Intervention Program Coverage on Stunting Prevalence Achievement in South Central Timor Regency

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Abstract

Background: The prevalence of stunting in NTT was 37.9% in 2023 and decreased slightly to 37% in 2024. This remains above the Indonesian health cut-off (10%) and WHO's threshold (20%). The NTT government continues its prevention and mitigation efforts to accelerate stunting reduction. **Objectives:** This study aims to analyze the effect of nutrition and health intervention program coverage on stunting prevalence in South Central Timor Regency. **Methods:** This qualitative study used secondary data for the 2024 period in TTS Regency. Data from the e-PPGBM application included intervention program coverage (Exclusive Breastfeeding and MP-ASI) and health program coverage (Complete Immunization, Defecation, Clean Water Availability, and Basic Sanitation). The dependent variable was stunting prevalence in the region. Logistic regression was used to test the influence of the program coverage on stunting prevalence. **Results:** The analysis found that exclusive breastfeeding coverage ($0.048 < 0.05$) and the proportion of families who stopped open defecation ($0.045 < 0.05$) significantly influenced stunting reduction in the area. **Conclusions:** Accelerating stunting reduction can be achieved by promoting exclusive breastfeeding for six months and encouraging clean and healthy living behaviors, particularly the cessation of open defecation.

Keywords: coverage of nutritional intervention programs, stunting prevalence achievement, open defecation (BABs), exclusive breastfeeding, south central timor regency

1. Introduction

Stunting is a nutritional problem caused by a lack of nutritional intake in children in the first 1,000 days of life, namely from when the child is still in the womb until the age of 2 years.¹⁻³ Since 2020, Indonesia has been ranked 2nd for the highest number of stunting in Southeast Asia. Data from the Ministry of Health of the Republic of Indonesia shows that around 1 in 3 Indonesian toddlers experience stunting. Meanwhile, data on the prevalence of stunting in NTT is known to be 37.9% in 2023 and then decreased to 37% in 2024. However, this prevalence rate is still much higher than the Indonesian health cutoff point of 10% and WHO 20%.^{4,5} The results of the study showed that the high percentage was influenced by many factors. These factors include: knowledge of mothers of toddlers due to low literacy related to stunting, lack of nutritional intake, personal and environmental hygiene, limited clean water, and the existence of poverty factors.^{6,7}

The results of other studies also concluded that stunting in children can be caused by problems during pregnancy, childbirth, breastfeeding, or afterwards, such as providing MPASI which does not provide sufficient nutritional intake⁸⁻¹⁰. In addition to poor nutrition, stunting can also be caused by poor parenting and poor environmental hygiene so that children often get infections. Until now, steps to overcome the problem of stunting are still partial so that the percentage of reduction is still very slow. General characteristics of stunting in children can be seen from the child's stature which is stunted when they reach the age of 2 years, or shorter than children of the same age with the same sex. In addition to being short or stunted, children who experience stunting also look thin.

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Although they look short and thin, the child's body is still proportional. However, it should be remembered that not all short children are called stunted. In addition to experiencing growth disorders, here are some characteristics of stunting in children: 1). Experiencing decreased intelligence, speech disorders, and difficulty in learning, 2). Having a low immune system, so they are more susceptible to illness, especially due to infectious diseases, 3). At risk of developing diabetes, hypertension, and obesity as adults. All of these characteristics of stunted children are the impact of lack of nutrition, frequent illnesses, and incorrect parenting in the first 1,000 days of a child's life. These various causes can actually be prevented⁹.

Stunting-related growth and development disorders are permanent, meaning they cannot be treated. However, this condition is very preventable, especially during the first 1,000 days of a child's life. Here are some ways to prevent stunting in children: 1). Fulfill the mother's nutritional needs during pregnancy and breastfeeding, especially iron, folic acid, and iodine, 2). Initiate early breastfeeding and provide exclusive breastfeeding to children, 3). Complete knowledge about good MPASI and its implementation, 4). Get used to living a clean and healthy life to prevent children from getting infectious diseases, such as washing hands with soap and water, especially before preparing food and after defecating or urinating, and washing eating utensils with dish soap¹¹. In addition, parents also need to check their children at the Integrated Health Post or Community Health Center regularly. This is done so that the child's weight and height gain can be monitored and then compared with the WHO growth curve. Routine check-ups are recommended to be carried out every month for children under 1 year old and every 3 months for children aged 1–2 years old. In addition to monitoring the child's height and weight, these routine check-ups are also needed to evaluate the possibility of infection in children, such as worms, tuberculosis, urinary tract infections, and recurrent diarrhea.

Based on the description above, this study was conducted to determine the effect of the scope of the nutritional intervention program (History of Exclusive Breastfeeding and History of MP-ASI) and health (Immunization History, Defecation Habits, PHBS Habits, Availability of Clean Water, and Environmental Sanitation) on the achievement of stunting prevalence in the South Central Timor Regency.

2. Materials and Methods

2.1 Study Design and Setting

This research is a type of secondary research or desk research. The method or design involves the use of existing data¹². The existing data is summarized and arranged to improve the overall effectiveness of the research. The research was conducted through a quantitative and qualitative study approach for 12 months, namely January - December 2024 in the South Central Timor Regency, NTT Province.

2.2 Population and Sampling

Population is the total number of subjects to be studied by a researcher¹³. While the sample is a small part of the number of information subjects or data analyzed to represent the data population in the study. In this study, the population and samples used were all secondary data from toddlers aged 0-59 months in all villages in TTS Regency and information from related SKPDs in the regency as parties that will contribute qualitative supporting data in this study.

2.3 Data Collection

Secondary research generally uses data published by the local governments of TTS district and NTT province as well as non-governmental institutions related to the acceleration of stunting reduction. This study uses secondary data with variables originating from the individual level and the Regency/City level. The results of measuring variables originating from the Regency/City level are obtained from the Health Profile and Sensitive and Specific Program Coverage Data originating from related OPDs in 2024.

Secondary (quantitative) data includes specific and sensitive intervention program coverage data such as Policy/Program Support coverage data related to Stunting. Furthermore, the data is grouped or categorized to be converted into quantitative data and analyzed further. The local government organizations (OPD) involved in this study are OPDs/Departments that have programs/activities in accordance with the national stunting intervention coverage indicators, namely: Health Office, Social Service, Agriculture and Food Security Service, Public Works and Public Housing Service, Education, Culture and Sports Service, and Child Protection and Women's Empowerment Service.

2.4 Variables and Operational Definitions

This study uses independent variables such as 7 intervention program coverages such as: 1. Exclusive breastfeeding, 2. MP-ASI, 3. Immunization, 4. Defecation, 5. Availability of clean water, and 6. Sanitation. While the dependent variable is the achievement of stunting prevalence in the South Central Timor Regency. The following is the operational definition used :

1	Coverage of Exclusive Breastfeeding :	Good if coverage is above 60% and Bad if below 60%
2	Coverage of Complementary Feeding Behavior :	Good if coverage is above 60% and Bad if below 60%
3	Coverage of Basic Immunization Program:	Good if coverage is above 60% and Bad if below 60%
4	Coverage of Open Defecation Behavior :	Good if coverage is above 60% and Bad if below 60%
5	Coverage of Household Programs Using Proper Drinking Water :	Good if coverage is above 60% and Bad if below 60%
6	Coverage of Household Programs Using Proper Sanitation :	Good if coverage is above 60% and Bad if below 60%
7	Coverage of Clean and Healthy Lifestyle Patterns :	Good if coverage is above 60% and Bad if below 60%
8	Stunting prevalence achievement :	Good if the prevalence of stunting is less than 10% and Bad if the prevalence of stunting is above 10%

2.5 Data Analysis

Data processing generally begins with coding, editing, entry and cleaning steps. Documents are then analyzed according to the interests of answering each research objective. Among others: Objective 1 uses descriptive analysis or percentage distribution tables and is depicted in the form of a line diagram to determine the profile of stunted toddler families and the distribution of stunting determinants for the 2024 period. Objective 2 uses Simple Logistic Regression analysis to determine the effect of intervention program coverage on stunting prevalence achievements.

2.6 Ethical Considerations

This study uses the Code of Ethics permit which was studied and considered by the Ethics Review Team of the Faculty of Public Health, Nusa Cendana University with the administration number: 000200/KEPK FKM UNDANA /2025.

3. Results

3.1. Program Coverage Profile

The results of the analysis show that most (>70%) of toddler families in TTS Regency have a history of Exclusive Breastfeeding, Complementary Food Giving Behavior, Basic Immunization History, use of Clean Drinking Water, and use of Good Sanitation. This is indicated by the large coverage of intervention programs such as: coverage of the Exclusive Breastfeeding program (74.6%); Coverage of Complementary Food Giving Behavior (99.2%); Coverage of Basic Immunization Program (75.4%); Coverage of Household Programs Using Clean Drinking Water (72.1%) and Coverage of Household Programs Using Clean Sanitation (68%).

Table 1. Overview of the Scope of the Stunting Prevention Intervention Program in South Central Timor Regency, 2024

No	Program Coverage Variables	n	%
A	Coverage of Exclusive Breastfeeding		
	1. Good	91	74.6
	2. Not Good	31	25.4
B	Coverage of Complementary Feeding Behavior		
	1. Good	121	99.2
	2. Not Good	1	0.8
C	Coverage of Basic Immunization Program		
	1. Good	92	75.4
	2. Not Good	30	24.6
D	Coverage of Open Defecation Behavior		
	1. Good	49	40.2
	2. Not Good	73	59.8
E	Coverage of Household Programs Using Proper Drinking Water		
	1. Good	88	72.1

	2. Not Good	34	27.9
F	Coverage of Household Programs Using Proper Sanitation		
	1. Good	83	68.0
	2. Not Good	39	32.0
G	Coverage of Clean and Healthy Lifestyle Patterns		
	1. Good	21	17.2
	2. Not Good	101	82.8

Meanwhile, the Coverage of Open Defecation Behavior (59.8%) and Coverage of Clean and Healthy Lifestyle Patterns (82.8%) are poor. This shows that supporting the acceleration of stunting reduction requires cross-sectoral cooperation with the community, especially at-risk families. Based on this data, it is suspected that the prevalence of stunting in TTS Regency has a slow downward trend because it is still influenced by high defecation behavior factors and very low clean and healthy lifestyle habits.

3.2. The Influence of Program Coverage on Stunting Prevalence Achievement in South Central Timor Regency in 2024

Previous research results showed that the incidence of stunting in the dry land areas of the NTT archipelago was influenced by various factors. This study found the same thing where the factors of the history of exclusive breastfeeding, behavior of providing complementary feeding, history of complete immunization, defecation behavior, hygiene behavior (clean and healthy lifestyle), adequacy of clean water, and accessibility of clean sanitation were still very influential. Table 2 shows the results of the analysis that most of the coverage of the intervention program was evenly distributed for the good (>50%) and bad (>50%) categories.

Table 2. Effect of Program Coverage on Stunting Prevalence Achievement in South Central Timor Regency in 2024

Program Coverage	Stunting Prevalence Achievement				Total		pValue ;OR	CI 95%
	Good		Not Good		n	%		
	n	%	n	%				
Immunization Coverage								
1. Not Good	28	93.3	2	6.7	30	100	0.725	-
2. Good	84	91.3	8	8.7	92	100		
Coverage of Complementary Food Providing Behavior								
1. Not Good	1	100	0	0.0	1	100	0.764	-
2. Good	111	91.7	10	8.3	121	100		
Exclusive Breastfeeding Program Coverage								
1. Not Good	31	100	0	0.0	31	100	0.048	1.045 -
2. Good	81	89.0	10	11.0	91	100	1.123	1.208
Coverage of Open Defecation Behavior								
1. Not Good	70	95.9	3	4.1	73	100	0.045	0.954 -
2. Good	42	85.7	7	14.3	49	100	3-889	15.858
Coverage of Household Programs Using Safe Drinking Water								
1. Not Good	29	85.3	5	14.7	34	100	0.23	-
2. Good	83	94.3	5	5.7	88	100		
Coverage of Household Programs Using Proper Sanitation								
1. Not Good	34	87.2	5	12.8	39	100	0.22	-
2. Good	78	94.0	5	6.0	83	100		
Clean and Healthy Lifestyle Coverage								
1. Not Good	93	92.1	8	7.9	101	100	0.911	-
2. Good	19	90.5	2	9.5	21	100		

The results of the analysis showed that the coverage of the Exclusive Breastfeeding program (pValue: 0.048<0.05; OR: 1.123, 95% CI = 1.045-1.208) and the coverage of open defecation behavior (pValue: 0.045<0.05; OR: 3.889, 95% CI = 0.954-15.858) influenced the achievement of the prevalence of stunting in TTS Regency. Further analysis showed that both program coverages provided the same risk of 1.123 - 3.889 for stunting incidents.

4. Discussion

Breast milk is the main food needed by babies from birth to six months of age. The government has also guaranteed the fulfillment of the baby's rights through Government Regulation (PP) number 33 of 2012¹⁴. The first two years of a child's life are very important, because optimal nutrition during this period reduces morbidity and mortality, reduces the risk of chronic diseases, and promotes better overall development. Therefore, optimal breastfeeding, namely when the child is 0-23 months old, is very important.^{15,16} Breast milk is the ideal nutrition for babies that contains the most appropriate nutrients for the baby's needs and contains a set of protective substances to fight disease. Exclusive breast milk is breast milk given to babies from birth for 6 months, without adding and or replacing with other foods or drinks³.

The coverage of the exclusive breastfeeding program in NTT varies by year and location, but in general, NTT has a fairly high coverage in Indonesia. In 2024, NTT reached 81.18%, placing this province in the second highest national ranking after NTB. TTS Regency has a coverage of 86.5% in 2024, above the NTT provincial target.¹⁷

The results of the study indicate that exclusive breastfeeding offers many benefits for mothers and babies. Babies who receive exclusive breastfeeding can improve their immune system, prevent disease, support brain and physical development, and reduce the risk of allergies and chronic diseases including meeting the body's nutritional needs. Mothers who provide exclusive breastfeeding help maintain health and weight, reduce the risk of bleeding after childbirth, and can even act as a natural birth control. The results of this study (Table 2) are in line with previous research opinions, namely that the coverage factor of exclusive breastfeeding affects the achievement of stunting prevalence. This means that providing perfect exclusive breastfeeding can affect the nutritional status and health of toddlers. Furthermore, if the provision of exclusive breastfeeding is not perfect, it will have a negative effect on the growth and development of toddlers. The Od Ratio analysis shows that the exclusive breastfeeding coverage factor has 1 risk of preventing an increase in stunting prevalence. Exclusive breastfeeding is given to babies because of its many benefits and advantages, including babies getting protection against attacks by clostridium tetani, diphtheria, pneumonia, E.Coli, salmonella, shigella, influenza, streptococcus, staphylococcus, polio virus, rotavirus and vibrio cholera. In addition, it can also increase children's IQ and EQ.

The Indonesian government has launched a mandatory 6-month exclusive breastfeeding program as an effort to reduce infant mortality rates. Exclusive breastfeeding is giving only breast milk to babies without the addition of other foods and drinks, except for medicines and vitamins in the form of syrup if needed. Breast milk is the best food for babies, because it contains all the nutrients they need to grow and develop healthily. If given water or other fluids, babies will easily feel full so they will not want to breastfeed^{16,18,19}.

The data must be surveyed in the e_PPGBM 2024 application, it is known that the scope of open defecation behavior is still high, namely 56.7%. This means that many people in TTS Regency still have the habit of defecating in the open. The results of the analysis show that the factor of the scope of defecation behavior affects the achievement of stunting prevalence. The habit of defecating in the open (BABS) has a negative impact on health and the environment. BABS can cause various diseases, including diarrhea, cholera, typhus, and intestinal worm infections. In addition, BABS also pollutes water, soil, and can cause unpleasant odors and inhibit the physical growth of children²⁰⁻²³.

The habit of defecating indiscriminately has a very negative impact on stunting. This behavior increases the risk of environmental pollution, the spread of diseases such as diarrhea, and worm infections that can interfere with nutrient absorption, thus increasing the risk of stunting in toddlers^{5,9,24-26}. The results of this study are in accordance with the results of the Od Ratio analysis which shows that the defecation coverage factor has a risk of 3,889 times in preventing an increase in stunting prevalence.

Open defecation pollutes the environment with human waste, which can be a medium for flies and other insects to spread bacteria, viruses, and parasites. This environmental pollution can cause the spread of diseases such as diarrhea, typhoid, cholera, hepatitis, and worm infections. Diarrhea caused by contaminated feces can interfere with the absorption of nutrients by the intestines, causing children to be malnourished and at risk of stunting. Open defecation can also cause worm infections,

which can also interfere with nutrient absorption and increase the risk of stunting. Stunting is a condition in which children have stunted growth, both physically and mentally, due to chronic malnutrition. The habit of open defecation can be one of the contributing factors^{5,9,24-29}.

5. Conclusions

Exclusive breastfeeding coverage and defecation behavior coverage affect the achievement of stunting prevalence in TTS Regency, East Nusa Tenggara Province. Strengthening the level of knowledge of mothers of toddlers and adolescent girls about the importance of exclusive breastfeeding and nutrition education and increasing food access through local food-based interventions can help reduce the increase in stunting prevalence.

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7. Conflicts of Interest

The author declares no conflict of interest.

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