

# Stunting Prevention Through Participative Counselling on The Implementation of Balanced Nutrition Toward Children by Involving Local Puppeteers in Central Lombok Regency, West Nusa Tenggara

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## ABSTRACT

Stunting in toddlerhood will affect the quality of life at school age, adolescence, and even adults. Nutrition education for mothers and caregivers of toddlers is one of the recommendations to alleviate the problem of stunting. This study aimed to determine the effect of stunting prevention through participatory counselling on the application of balanced nutrition in children under five by involving local puppeteers in Central Lombok Regency, West Nusa Tenggara. This research used a quasi-experimental design. The number of subjects in this study was children under five, and their mothers were about 66 people consisting of 33 people in each group (treatment group and control group). Different T-test analysis was used to see differences in nutrient intake between both groups. Providing nutrition education through local puppeteers to children under five and their mothers had a significant effect ( $p < 0.05$ ) on the intake of nutrients in the form of energy, protein, carbohydrates, vitamin C, iron, calcium, and fibre. These stunting preventions through participatory counselling on balanced nutrition by involving local puppeteer's potential to be developed as an alternative for stunting prevention toward children under five.

**Keywords:** Stunting, Balanced Nutrition, Children, Local Puppeteers

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## INTRODUCTION

Stunting is a nutritional problem faced by the world, especially in poor and developing countries to date (Mwangome et al., 2020). Stunting known as a failure of linear growth in the form of malnutrition, impact on the short and long term, associated with increased morbidity and mortality, physical decline, neurodevelopmental and increased risk of metabolic disease into adulthood (Prendergast and Humphrey, 2014; Yuniyanto et al., 2020). Stunting in infancy will affect the quality of life at school age, adolescence, and even adults (de Onis & Branca, 2016).

A generation that grows optimally or is not stunted has a better level of intelligence, which will provide good competitiveness in the fields of development and economy (Tassew Woldehanna, Jere R. Behrman, 2017; Viridula et al., 2016). Besides, optimal growth can reduce the burden on the risk of cardiometabolic and metabolic syndromes that cause degenerative diseases (Grillo et al., 2016; Rolfe et al., 2018). Degenerative diseases such as diabetes, hypertension, heart, kidney are diseases that require high medical costs (Nichols & Moler, 2011). This disease develops in urban and rural areas, even in rural areas the rate is increasing (Yuniyanto et al., 2015, 2019). Thus, if stunting growth can be prevented, it is hoped that economic growth can be better, without being burdened by the costs of treating degenerative diseases (Mary, 2018; Yaya et al., 2020).

The results of the Basic Health Research (Riskesdas) in 2018, reported that the nutritional status of children under five in Indonesia is still relatively high, namely: 17.7% underweight prevalence, consisting of 3.9% malnutrition and 13.8% malnutrition. ; the prevalence of

stunting was 30.8% consisting of 11.5% being very short and 19.3% being short; the prevalence of wasting is 10.2% consisting of 3.5% skinny and 6.7% thin (Kemenkes RI, 2018). Data from the monitoring of Indonesia National Nutritional Status in 2017, it was found that the prevalence of stunting under five in West Nusa Tenggara Province was 37.2%, and in Central Lombok Regency was 39.3% (Health Agency of West Nusa Tenggara Province, 2017). The results of the 2018 National Basic Health Survey, the stunting rate in this Province was 33%. So 3 to 4 out of 10 toddlers are stunted (Kemenkes RI, 2019).

The results of the study by Unicef Indonesia revealed that one of the factors causing stunting is inadequate knowledge and inappropriate nutritional practices. (Unicef Indonesia, 2013). Nutrition counselling for mothers and caregivers of toddlers is one of Unicef Indonesia's recommendations to alleviate the problem of stunting in Indonesia. Nutrition counselling is a part of health education activities, defined as a planned effort to change the behaviour of individuals, families, groups and communities in the health sector, especially in the field of nutrition. (Zahid Khan et al., 2013).

Eating habits are crucial because they are closely related to the state of nutrition, especially the quality and quantity of food consumed. The variety of types of food consumed will affect the quality and completeness of nutrients, and the more diverse the quality and completeness of nutrients will meet the needs (Ruel, 2003). Study of (Ahmad et al., 2018), It was found that children who were not stunted had a more diverse menu than children who were stunted. Also, there are

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differences in the intake of energy and macro protein nutrients and the intake of micronutrients such as vitamin C, calcium and phosphorus between stunted and non-stunting children. The eating habits of children aged two years and over in Central Lombok, that most people allow their children to snack, especially pentol (cilok meatballs made of starch mixed with a little meat and a mixture of spices) and snacks that are sold around the village or in small shops. Children are allowed to choose the food they like without any restrictions (Nurbaiti et al., 2014).

One of the ways to improve children's food consumption habits is nutrition education. Previous research conducted by (Sánchez-Encalada et al., 2019) revealed that the counselling conducted to mothers of children under five showed an increase in the awareness of mothers to pay more attention to the health of their children. However, in this study, message delivery is still carried out through one-way communication, without paying attention to the perspective of mothers under five. It was also revealed that in this study, the delivery of messages on nutrition and health did not involve the socio-cultural factors of the local area.

Based on the description above, in this study, the prevention of stunting has been carried out through participatory counselling on the application of balanced nutrition in toddlers by involving local puppeteers in Central Lombok Regency, West Nusa Tenggara. The novelty that can be expressed in this research is an effort to overcome stunting through participatory counselling that involves local culture, namely the local puppeteer of Central Lombok, West Nusa Tenggara.

### METHODOLOGY

The research design for stunting prevention through participatory counselling on the application of balanced nutrition in under-five children involved local puppeteers in the Mantang Health Center, Central Lombok Regency, West Nusa Tenggara, using a quasi-experimental design. The research was conducted in June - November 2019, in the Work Area of the Mantang Health Center, Central Lombok Regency, West Nusa Tenggara.

The main ingredients of the research were materials for participatory counselling involving local puppeteers consisting of fresh food ingredients from various groups of local food ingredients, balanced nutrition guidelines, the concept of balanced nutrition in the visualization of the Isi Piringku (in Indonesian and local / Sasak languages). The equipment included tools for the preparation of counselling media, tools for measuring height, weight, writing instruments, questionnaires for mothers under five, a form for recalling, semi-quantitative FFQ (food frequency questioner), and others. The subjects in this study were children under five with stunting and their mothers which consisted of two groups, namely the treatment group and the control group. The subjects in this study were 66 people, namely 33 children under five who experienced stunting as the treatment group and 33 children under five who were stunted as a control. The treatment group would be given participatory counselling interventions about the application of balanced nutrition for children under five by involving local puppeteers. In contrast, the control group would be given counselling interventions on the application of balanced nutrition for children under five using conventional methods.

The research subjects were children aged 2-5 years who were stunted (Z score:  $<-2$  SD) and their mothers. The inclusion criteria of research subjects were children who did not have a chronic disease, did not have heart or liver problems, were not undergoing similar nutritional interventions, and were willing to be involved in this study, their mothers could read and write.

Data analysis was performed using SPSS version 25, testing the mean difference between before and after the intervention, the paired t-test was carried out to determine differences in nutrient intake in children under five.

### RESULTS AND DISCUSSION

The characteristics of the research subjects are presented in Table 1. The subjects consisted of the control and treatment groups. Each group consists of 34 subject.

Based on Table 1, it can be seen that the characteristics of the subjects, including gender and the age of children under five did not differ significantly between the control group and the treatment group. The distribution of education and occupation of mothers under five in the control and treatment groups was not different; most of the primary school and housewives education. Previous research by (Titaley et al., 2019) states that education and work are indirect factors that can contribute to the incidence of stunting in children under five. Most of the subject group of children under five with stunting received exclusive breast milk. Inadequate breastfeeding practice is also a risk factor for the incidence of stunting in children under five.

Mother's knowledge about balanced nutrition, especially knowledge about balanced nutrition for children under five is one of the factors that influence mothers in choosing food ingredients and giving food to children (Simanjuntak et al., 2019). Mother's knowledge of balanced nutrition is one of the indirect factors that can affect the incidence of stunting in children under five. The mean score of maternal knowledge about balanced nutrition is presented in Table 2.

Table 2 shows that there was a significant difference ( $p < 0.05$ ) in the scores of mother knowledge about balanced nutrition before and after the intervention in the control and treatment. The increase in knowledge scores in the treatment group was higher than the control group ( $p < 0.05$ ). So participatory counselling interventions on the application of balanced nutrition for children under five involving local puppeteers in Central Lombok Regency, once a week for six weeks continuously could increase the score of mother's knowledge about balanced nutrition. So participatory counselling by involving local puppeteers is proven to be effective in increasing the score of mother's knowledge about balanced nutrition. This is in line with research conducted by (Mahmudiono et al., 2018) that the nutrition counselling intervention once a week for three weeks can increase the score of maternal knowledge about balanced nutrition. The results of this study also showed that counselling with attention to mother's perceptions and local culture gave better results than one-way counselling using conventional methods.

Based on the data in Table 3, it can be seen that the staple foods consumed by the subjects were rice, bread and noodles. Rice is the staple food most often consumed by subjects in the control and treatment groups. Besides, consumption of noodles is second only to rice. Noodles

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are a food source of carbohydrates that are liked by children (Yuliantini & Yuniato, 2020). The animal food groups commonly consumed by the subjects were eggs, milk, chicken meat, and fish. Eggs are the most commonly consumed source of animal protein. According to our data, there was a tendency to increase the frequency of egg and fish consumption after participatory counselling interventions on balanced nutrition involving local puppeteers were carried out. Fish, also other seafood known as good source of nutritive and non-nutritive compounds, for an instance, *Meretrix meretrix* and fermented shrimps consist of bioactive as antioxidant substance may improve the human health (Fadly et al., 2020; Minsas et al., 2020; Sofiana et al., 2020). Types of vegetable protein sources consumed by the subjects were

tofu and tempeh. Tempe is the most commonly consumed source of vegetable protein. There was a tendency to increase the consumption frequency of tempeh and proportion of tofu consumed after the intervention. This is in accordance with previous research by (Mahmudiono et al., 2018) shows that the provision of nutritional education significantly increases protein consumption. The types of vegetables consumed by the subjects were spinach, moringa leaves, water spinach, long beans, green beans, mustard greens, and bean sprouts. The vegetables most frequently consumed by the subjects were spinach and moringa leaves. There was a tendency to increase the carrots and long beans consumption by subjects after the implementation of the intervention..

**Table 1.** Distribution of research subjects based on characteristics

Characteristics	Group			
	Control		Treatment	
	N	%	N	%
Sex:				
Male	17 respondents	50.00	20 respondents	58.82
Female	17 respondents	50.00	14 respondents	41.20
Average Age (Months)	42.59±10.75 <sup>(a)</sup>		41.82±10.03 <sup>(a)</sup>	
Average Sibling	2.24±1.30		2.09±1.08	
Average Z-score	-2.97±0.80		-3.39±1.48	
Exclusive breastfeeding				
Yes	27 respondents	79.41	28 respondents	82.35
No	7 respondents	20.59	6 respondents	17.65
Mother education :				
Primary school	13 respondents	38.24	9 respondents	26.47
Junior High School	9 respondents	26.47	8 respondents	23.53
Senior High School	11 respondents	32.35	9 respondents	26.47
University	1 respondent	2.94	8 respondents	23.53
Mother occupation :				
Housewife	22 respondents	64.71	18 respondents	52.94
Farmer	5 respondents	14.71	-	-
Private work	7 respondents	21.19	12 respondents	35.29
Civil Servants	-	-	4 respondents	11.77
Average income (Rp/month)	1.140.625 ± 843.517		1.709.091±1.250.028	

**Table 2.** Mean scores of mother's knowledge about balanced nutrition in the control and treatment groups before and after the intervention in Central Lombok and Deli Serdang

Group	Knowledge (Mean ± SD)		
	Before Intervention	After Intervention	Difference
Control	26.80±14.08 <sup>a)</sup>	54.17±22.39 <sup>b)</sup>	27.37±16.90
Treatment	36.66±19.78 <sup>a)</sup>	71.42±16.67 <sup>b)</sup>	47.41±21.81

Note: numbers followed by different letters on the same row indicate a significant difference between before and after the intervention (p <0.05)

**Table 3.** Average values of frequency and amount of subject intake by type of food in control and treatment subjects.

No	Food	Frequency (times/week)				Total each portion (g)			
		Control		Treatment		Control		Treatment	
		Before	After	Before	After	Before	After	Before	After
1	Staple food								
	Rice	20.00	20.50	20.00	20.30	70.50	77.64	72.67	78.67
	Noodle	2.19	2.19	1.45	1.55	52.25	53.38	45.00	45.00
	Bread	1.80	2.00	1.71	2.80	40.00	40.00	35.71	40.00
2	Animal protein source								
	Egg	5.87	6.00	6.00	7.00	48.21	50.00	50.00	50.00

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	Milk	4.82	5.00	4.63	5.00	40.00	40.00	40.00	40.00
	Chicken	1.35	1.64	1.45	1.85	44.00	45.00	40.00	50.00
	Fish	1.50	3.00	1.10	3.50	40.00	41.54	50.00	50.00
3	Plant protein source								
	Tempeh	6.07	6.20	6.14	6.35	36.54	37.00	38.85	40.00
	Tofu	4.55	4.61	4.75	5.00	43.18	46.15	45.27	50.18
4	Vegetable								
	Spinach	2.40	3.20	2.46	3.50	25.00	25.00	30.00	30.00
	Moringa leaves	2.40	2.80	2.82	3.00	38.00	39.09	38.00	40.00
	Bean sprout	2.00	2.00	21.25	22.00	2.10	2.11	20.00	25.00
	Water spinach	1.86	1.86	1.90	2.00	30.00	30.00	30.00	30.00
	Mustard greens	1.80	1.83	1.70	2.00	25.00	25.00	25.00	25.00
	Carrot	1.70	2.50	2.53	3.00	27.78	30.00	26.00	30.00
	Green beans	1.71	1.60	1.63	1.63	22.00	25.00	25.00	25.00
5	Fruit								
	Oranges	2.00	2.00	1.90	2.50	91.25	100.00	90.00	100.00
	Papaya	1.73	1.80	1.90	2.00	55.00	60.00	50.00	60.00
	Water melon	1.98	2.00	1.80	2.00	50.00	50.00	50.00	55.00
	Banana	1.69	1.70	1.65	2.00	50.00	50.00	50.00	50.00
	Mango	1.36	1.50	1.35	2.00	75.00	75.00	75.00	75.00
	Dragon fruit	1.63	1.50	1.60	1.60	46.88	40.00	50.00	50.00
6	Snack								
	Cilok	6.83	5.00	7.00	6.00	46.00	50.00	40.00	40.00
	Bakso	2.17	2.00	2.00	2.50	60.00	60.00	50.00	60.00
	Fried banana	2.00	2.50	2.00	3.00	50.00	50.00	50.00	50.00

**Table 4.** Average Percentage of Nutrient Intake (Energy, Protein, Carbohydrate, Vitamin C, Iron, Calcium, Fe, and Food Fiber) against Recommended Nutritional Adequacy Rate in Control and Treatment Groups.

Nutrients	Control			Treatment		
	Before intervention	After intervention	Difference	Before intervention	After intervention	Difference
Energy	65.58±21.73 <sup>a)</sup>	66.34±19.29 <sup>a)</sup>	0.76±24.45	74.81±23.49 <sup>a)</sup>	89.33±27.02 <sup>b)</sup>	14.52±21.83
Protein	81.14±16.23 <sup>a)</sup>	91.00±10.83 <sup>b)</sup>	9.86±8.89	80.37±11.68 <sup>a)</sup>	96.00±15.63 <sup>b)</sup>	15.63±10.58
Carbohydrate	59.40±19.07 <sup>a)</sup>	66.57±27.54 <sup>b)</sup>	8.25±30.43	73.31±33.86 <sup>a)</sup>	84.26±30.61 <sup>b)</sup>	10.95±3.55
Vitamin C	48.02±50.83 <sup>a)</sup>	53.63±19.86 <sup>a)</sup>	4.81±18.35	38.52±14.45 <sup>a)</sup>	74.66±17.37 <sup>b)</sup>	36.14±18.76
Fe	33.32±29.99 <sup>a)</sup>	33.42±50.45 <sup>a)</sup>	0.79±17.97	56.35±54.18 <sup>a)</sup>	86.57±50.24 <sup>b)</sup>	28.50±9.78
Calcium	16.23±9.12 <sup>a)</sup>	19.52±80.74 <sup>a)</sup>	2.99±16.51	19.41±13.16 <sup>a)</sup>	36.66±12.93 <sup>b)</sup>	17.25±7.95
Fibre	32.02±20.54 <sup>a)</sup>	33.32±29.99 <sup>a)</sup>	1.03±33.77	34.36±6.04 <sup>a)</sup>	47.98±6.58 <sup>b)</sup>	13.96±6.82

Note: Numbers followed by different letters on the same row indicate a significant difference between before and after the intervention ( $p < 0.05$ )

Nutrition education, in particular, can increase knowledge and change eating behaviour. Providing nutrition education has an impact on changing better eating patterns (Kilaru et al., 2005). Table 4 shows that the consumption of energy, protein, carbohydrates, and other nutrients. Vitamin C, Fe, calcium and dietary fibre in the treatment group showed a significant difference between before and after the intervention ( $p < 0.05$ ). In the control group, there was only an increase in protein and carbohydrate intake ( $P < 0.05$ ). Based on the data, it can be seen that the increase in nutrient intake in the treatment group is higher than the control group. A diet high in protein (eggs, milk, meat, fish, nuts ) and carbohydrates (rice, noodles, bread and snacks) may be associated with a reduced chance of stunting among

children (Esfarjani et al., 2013). Instant powdered with the addition of moringa oleifera leaf powder as complementary food for infants 6-12 months old and nutritional content qualified by the Indonesian National Standard nutrient was protein, fiber, and water content, energy and fat were lower, but carbohydrates were high (Zakaria et al., 2020). Nutrition education significantly affects changes in the diet of children under five, increasing calories and nutrient intake, both macro and micro (Azadbakht & Esmailzadeh, 2012; Kamsiah, Emy Yuliantini, 2020). This increase in food intake also indirectly affects the improvement of the nutritional status of children and the health level of children under five (Tapsell et al., 2016). Educational innovation succeeded in giving early understanding about nutritional

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anemia and CED prevention to bride (Citrakesumasari et al., 2020).

## CONCLUSION

Stunting prevention through participatory counselling on balanced nutrition by involving local puppeteers in Central Lombok Regency has proven effective in increasing mother's knowledge about balanced nutrition for stunting children under five. This intervention is also proven to increase nutrient intake in children under five with stunting. Stunting prevention through participatory counselling on balanced nutrition by involving local puppeteers has the potential to be developed as an alternative for stunting prevention efforts in children under five.

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## CONFLICT OF INTEREST

All authors declare that there is no conflict of interest in this study.

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