



Specific Interventions to Prevent Stunting in Children Under 2 Years after the Natural Disaster

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Abstract

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BACKGROUND: Nutrition specific reflects most of the evidence of programmatic successes, such as improving breastfeeding. Specific intervention is an action or activity that is specifically directed at the first 1000 days of life. In general, these activities are carried out by the health sector.

AIM: Study aims to analyze specific interventions for preventing stunting in children under 2 years of age in post-natural disaster areas.

METHODS: This type of quantitative analytic research with a cross-sectional design conducted in Palu City central of Sulawesi Indonesia from October until November 2020. The population in this study were mothers and children under 2 years. Sampling using consecutive sampling technique with a total of 384 samples. Data analysis using a frequency distribution, height Z score table according to the Ministry of Health of the Republic of Indonesia.

RESULTS: The prevalence of stunting in children under 2 years of age in Palu was 37.24%. The only specific intervention behavior in preventing stunting that was statistically significant was breastfeeding for up to 2 years ($p = 0.025$).

CONCLUSIONS: Specific interventions to prevent stunting in children under 2 years after natural disasters are breastfeeding children up to 2 years. The prevalence of stunting in children under 2 is 37.24%. To reduce stunting problems in the city of Palu Central Sulawesi, Indonesia, mothers need to be informed about the risks and assistance from local and central government.

Introduction

Nearly three decades of research support a strong relationship between the complicated biological processes that can occur during the first 1000 days of life and the resulting multiple burdens of malnutrition, including stunting [1], [2], [3]. Specific intervention is an action or activity that is specifically directed at the first 1000 days life children. In general, these activities are carried out by the health sector, such as immunization, supplementary feeding for pregnant women and infants, monitoring the growth of infants, supplementation of iron-folate tablets for pregnant women, promotion of exclusive breastfeeding, and supplementary feeding of breast milk. The specific intervention is short term, and it is possible to record the results in a relatively short time. Different development activities outside the health sector are sensitive interventions. However, if planned specifically and integrated with specific activities, the impact is sensitive to the safety of the first 1000 days of life's growth and development process [4].

The Republic of Indonesia's Ministry of Health Basic Health Research reported that the national prevalence of child stunting was 37.2% in 2013 and

decreased to 30.2% in 2018 [5], [6]. The problem of stunting still needs to be controlled, despite the decline [7]. Sumiaty *et al.* study showed that maternal height of <150 cm, birth spacing of <3 years, and lack of prenatal care were risk factors for stunting [8]. Ethiopian research shows that risk factors for stunting include maternal age >30 years, mothers without formal education, mothers who work every day, mothers who do not perform PNC, and mothers who are ill during pregnancy [9]. Research in Bhutan shows that the risk factors for stunting in children 6–23 months are; the antenatal care (ANC) factor is <3 times, doctors, nurses, and midwives and mothers who are <18 years old do not perform ANC [10]. Prevention efforts can, therefore, be carried out by streamlining existing health programs, such as prenatal care, classes for pregnant women, supplementation with iron and calcium, and supplementary feeding for pregnant women [11]. In particular, through breastfeeding behavior improvement programs, a study also suggested long breastfeeding [12]. The government allocated national priority projects to reduce stunting in 2018, one of which is to improve maternal and reproductive health services [13].

A major earthquake with a current magnitude of 7.5 occurred on the island of Sulawesi, Indonesia, on September 28, 2018. This earthquake caused extensive

tsunami and liquefaction [14], [15], [16]. The impact of the earthquake was felt in Palu City, which is the location of this research. In catastrophic situations such as earthquakes, infants and young children have been identified as the most nutritionally vulnerable groups. In the early years of life, malnutrition and poor feeding practices may adversely affect the growth, cognitive, physical, and social development of children. The results of previous studies show that there are statistically significant differences in wasting, underweight, and stunting before and after the earthquake in various regions [17], [18], [19]. Study aims to analyze specific interventions for preventing stunting in children under 2 years of age in post-natural disaster areas.

Materials and Methods

This type of quantitative analytic research with a cross-sectional design conducted in Palu City from October until November 2020. The population in this study were mothers and children under 2 years in Palu City. Sampling using consecutive sampling technique with a total of 384 samples. Measuring instruments are in the form of tested questionnaires and length board measuring body length measuring instruments. The data used in this study are primary data and secondary data. Primary data are in the form of interventions that have been carried out on pregnant women, women giving birth, and children 0–23 months. Data analysis of specific nutrition interventions for mothers and children under 5 years of age was univariate using a frequency distribution, height using the Z score table according to the Ministry of Health of the Republic of Indonesia, and bivariate analysis using the Chi-square test. This study uses several strategies to maintain data quality standards. The first control begins with selecting field workers. The selected field workers are those who have the hard ability to collect data in the field, both quantitative data and qualitative data. Before going to the field, they were given training to equalize perceptions and how to measure/collect data in the field. The next step is to standardize research instruments, body length measuring instruments, and questionnaires. Standardization is carried out by conducting field trials in accordance with the conditions of the research location, the questionnaire trial is carried out in the work area of the Mamboro Community Health Center.

Results

This study involved 384 children under 2 years old who were paired with their mothers. Table 1 show that mothers of children under 2 years aged 20–35

years were 81.77%. The age of children 0–11 months is 50.52%. Most of the respondents were male at 54.69%. The prevalence of stunting in children under 2 years of age in Palu was 37.24%.

Table 2 show that there are 13 behaviors in the specific intervention group in efforts to prevent stunting in children under 2 years that were identified in this study. A 2-year-old child and his mother were victims of the earthquake, tsunami, and liquefaction in Palu City on September 28, 2018.

Table 1: Respondents characteristics in specific interventions to prevent stunting in children under 2 years after the natural disaster

Variable	Frequency (384)	Percentage (100%)
Mother age		
<20 years	16	4.17
20–35 years	314	81.77
>35 years	54	14.06
Child age		
0–11 months	194	50.52
12–23 months	190	49.48
Child sex		
Boys	210	54.69
Girls	174	45.31
Nutritional status children under 2 years		
Stunting	143	37.24
Normal	241	62.76

The results showed that there was a correlation between increasing age and the prevalence of stunting, namely the increasing age of children under five, the higher the prevalence of stunting. Table 3 show that in the 0–11 months age group, the prevalence of stunting was 24.23%, while in the 12–23 months group, the prevalence of stunting was 50.53%. This difference was statistically significant ($p = 0.000$). The only specific intervention behavior in preventing stunting that was statistically significant was breastfeeding for up to 2 years ($p = 0.025$). In the group of mothers who consistently gave breast milk for up to 2 years, the prevalence of stunting was only 39.18%. The behavior of other specific interventions in preventing stunting was not statistically significant.

Discussion

Children under 2 and his mother were victims of the earthquake, tsunami, and liquefaction in the context of crisis and post-natural disasters, specific interventions implemented in Palu City for the first 1000 days of life for stunting prevention, in Palu Central Sulawesi showed a 37.24% prevalence of stunting in children under 2 years. The only specific intervention behavior that was statistically significant in preventing stunting was breastfeeding for up to 2 years.

The length and weight of breastfed infants during the first 2 years in developing countries are highly affected by the respective anthropometric parameters at birth. Gambia and Zimbabwe studies indicate that only breastfed infants with birth length and weight

Table 2: Specific interventions to prevent stunting in children under 2 years after the natural disaster

Variable	Frequency (384)	Percentage (100%)
Breastfeeding until 2 years of age		
No	42	10.94
Yes	342	89.06
Giving biscuit to pregnant women		
No	18	4.69
Yes	366	95.31
Provision of iron supplement tablets to pregnant women		
No	1	0.26
Yes	383	99.74
Calcium supplementation to pregnant women		
No	5	1.30
Yes	379	98.70
Delivery of mothers in health facilities		
No	1	0.26
Yes	383	99.74
Early initiation of breastfeeding		
No	30	7.81
Yes	354	92.19
Colostrum administration		
No	15	3.91
Yes	369	96.09
Exclusive breastfeeding		
No	27	7.03
Yes	357	92.22
Provision of complementary foods for infant over 6 months		
No	3	0.78
Yes	381	99.22
Giving Vitamin A twice to children under 2 years of age		
No	1	0.26
Yes	383	99.74
Giving Vitamin A to postpartum mothers		
No	7	1.82
Yes	377	98.18
Complete basic immunization		
No	5	1.30
Yes	379	98.70
Regular visits to Posyandu (integrated service posts)		
No	2	0.52
Yes	382	99.48

above the respective WHO 0 Z scores continue to grow adequately and at 18 and 24 months have length and weight above the WHO 0 Z scores [20]. It was found that breastfeeding has a significant relationship with stunting and severe stunting in the 2nd and 3rd years of life. To reduce the burden of undernutrition in the country, mothers need to be informed about the risks of prolonged breastfeeding [21]. The Ipa study shows that children refuse to breastfeed (10%), have 17.3% formula milk, the reason kids do not breastfeed over 2 years. For the prevention of stunting, breastfeeding frequency was significant [22]. All breastfeeding and being female were consistent protective variables across all models against child stunting. Stunting models can be achieved by maximizing better breastfeeding [23], [24]. To avoid bottle feeding, infant and child feeding is carried out to the extent possible. A good understanding of cleanliness and presentation is required when forced to use a milk bottle [25].

Optimal growth and development in early childhood is determined by a complex interplay of child, maternal, household, environmental, and socioeconomic factors influencing nutritional intake, but interventions to decrease child malnutrition sometimes target specific risk factors in isolation [26], [27], [28]. The SUN Movement in Indonesia is called the National Movement for the Acceleration of Improvement of Nutrition in the First 1000 Days of Life Framework, shortened to the First 1000 Days of Life Movement. A series of activities have been carried out to formulate the

first 1000 days of life movement in Indonesia, involving key stakeholders consisting of ministries and institutions, the business world, international development partners, social and community organizations, and supported by ministries and institutions. The first 1000 days of life movement consists of specific nutrition interventions and sensitive nutrition interventions. The Government of the Republic of Indonesia launched the National Strategy for Accelerating Stunting Prevention 2018–2024 with priority targets which are pregnant women and children aged 0–2 years or the first 1000 days of life. The interventions were in the form of specific and sensitive nutrition interventions [29].

Specific nutritional interventions include supplementary feeding for pregnant women who experience chronic energy deficiency, provision of supplemented blood tablets to pregnant women, consumption of iodized salt, exclusive breastfeeding, breastfeeding until the age of 2 years accompanied by breast milk adequate, and children under 2 immunization status [30]. Research conducted by Rosha *et al.* on the role of specific and sensitive nutrition interventions in improving nutritional problems in Bogor City states that specific nutrition interventions include maternal intervention (pregnant women class, supplementary feeding for pregnant women, nutrition, and health seminars) and toddler intervention (monitoring toddlers in Posyandu, immunization, vitamins, and supplementary feeding and youth intervention) [31]. Muthia's (2019) research on the Evaluation of the Implementation of the Stunting Prevention Program in terms of the Specific Nutrition Intervention of the First 1000 Days of life Movement at Pegang Baru community health center Pasaman Regency stated that preventing stunting through specific intervention programs had not reduced stunting below 20% [32].

Systematic reviews of 14 studies in low- and middle-income countries show that the education of mothers and their partners is the most significant factor influencing maternal health service use in addition to wealth quintile, media exposure, and rural/urban housing [33]. There are five factors that contribute to stunting, namely, household and family factors, inadequate complementary feeding, inadequate breastfeeding practices, infectious disease factors, and social and community factors. Household and family factors include malnutrition during pre-conception, pregnancy and breastfeeding, short mothers, infections, teenage pregnancy, mental health, intrauterine growth retard and preterm birth, close labor distance, hypertension, stimulation and activity inadequate children, poor care practices, inadequate sanitation and water supply, food insecurity, inadequate household food allocation, and low caregiver education. Inadequate complementary food factors include poor quality micronutrients in complementary foods, low food diversity and food ingredients containing anti-nutrition, low-energy content in complementary foods, rarely, inadequate food during

Table 3: Specific interventions and nutritional status children under 2 children under 2 years after the natural disaster

Variable	Nutritional status children under 2				p-value
	Stunting n = 143	(%)	Normal n = 241	(%)	
Children age (month)					
0–11	47	24.23	147	75.77	0.000*
12–23	96	50.53	94	49.47	
Breastfeeding until 2 years of age					
No	9	21.43	33	78.57	0.025*
Yes	134	39.18	208	60.82	
Giving biscuit to pregnant women					
No	7	38.89	11	61.11	0.882
Yes	136	37.16	230	62.84	
Provision of iron supplement tablets to pregnant women					
No	0	0	1	100	0.441
Yes	143	37.47	240	62.66	
Calcium supplementation to pregnant women					
No	1	20.0	4	80.00	0.422
Yes	142	37.47	237	62.53	
Delivery of mothers in health facilities					
No	0	0	1	100	0.441
Yes	143	37.24	240	62.66	
Early initiation of breastfeeding					
No	9	30.00	21	70.0	0.393
Yes	134	37.85	220	62.15	
Colostrum administration					
No	2	13.33	13	86.67	0.051
Yes	141	38.21	228	61.79	
Exclusive breastfeeding					
No	6	22.22	21	77.78	0.094
Yes	137	38.38	220	61.62	
Provision of complementary foods for infant over 6 months					
No	0	0	3	100	0.180
Yes	143	37.24	238	62.47	
Giving Vitamin A twice to children under 2 years of age					
No	0	0	1	100	0.441
Yes	143	37.24	240	62.66	
Giving Vitamin A to postpartum mothers					
No	2	28.57	5	71.43	0.632
Yes	141	37.40	236	62.60	
Complete basic immunization					
No	3	60.0	2	40.0	0.289
Yes	140	36.94	239	63.06	
Regular visits to Posyandu (integrated service posts)					
No	1	50.0	1	50.0	0.708
Yes	142	37.17	240	62.83	

and after illness, consistency of liquid food, insufficient amount of food, food unresponsiveness, contamination of food and water, poor hygiene practices, unsafe storage, and preparation [34].

Consistent evidence of the Indonesian stunting determinant shows that non-exclusive breastfeeding, low household socioeconomic status, preterm birth, short birth length, low maternal height, and education for the first 6 months are the determinants of stunting in Indonesia. There are also greater risks for households with latrines that are not repaired and untreated drinking water. Community factors, poor access to health care and rural living, have been linked repeatedly to stunting [35]. The significant proximal drivers were improvements in early initiation of breastfeeding and a decrease in the prevalence of low birth weight. The findings reinforce the need to address the problem of stunting with a combination of nutrition-sensitive and specific interventions. The identified drivers help guide global efforts to further speed up the reduction of stunting and monitor progress against chronic undernutrition in children [36], [37], [38]. In their role in nutritional food choices, variables such as social, cultural, environmental, economic, gender, knowledge, and information intersect [39]. Data remain sparse on the coverage of many specific and sensitive nutritional interventions. The most often accessed country-specific data source was the Demographic Health Surveys and Global Nutrition Report [40].

Conclusions

Children breastfeeding up to 2 years are specified interventions to prevent stunting in children under 2 years after natural disasters. About 37.24% is the prevalence of stunting in children under 2. To reduce stunting problems in the Indonesian town of Palu Central Sulawesi, mothers need to be informed about the risks and local and central government assistance.

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