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Specific and Sensitive Nutrition Interventions with Nutritional Status of Toddlers as Prevention of Stunting in the Coronavirus Disease 2019 Pandemic in Sigi District, Indonesia

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Abstract

AIM: The research objectives were to determine the specific and sensitive intervention model in stunting prevention efforts in the coronavirus disease 2019 (COVID-19) pandemic and also to determine the relationship between specific and sensitive interventions on children's nutritional status under five in the COVID-19 pandemic in stunting locus village.

METHODS: This type of research was an observational study with a cross-sectional approach. The population size is 35 families of short children under five and the sample size is 35 people with the sampling technique is total sampling. This study used the Chi-square test with a significance level of $p < 0.05$ with SPSS computer software.

RESULTS: Nutritional status based on the body weight/age index, 63% was very underweight and underweight. Based on body height/age, 28.6% was stunted. Based on body weight/body height, 17.1% was severe malnutrition and 40.0 % was malnutrition. The results of the bivariate analysis for specific nutrition interventions with body weight/age showed $p = 0.98$, body weight/age had $p = 0.668$, and body height/age had $p = 0.968$, which indicated no significant relationship.

CONCLUSIONS: Sensitive nutrition intervention showed no relationship between sensitive intervention and children's nutritional status under five.

Introduction

The incidence of stunting under five is one of the nutritional problems experienced by children under five in the world today [1], [2]. Globally, nearly 200 million children under five are stunted, wasted, or both, and a minimal 340 million from hunger are hidden from deficiency of vitamins and minerals [3]. Nutritional problems account for 45% of child deaths under five. Investing in increased nutrition interventions would save 900 lives, reduce stunting by 20%, and malnutrition by 61% [4].

It is crucial to reduce stunting as early as possible to avoid long-term adverse effects such as stunted child development [5]. Stunting affects brain development so that the child's intelligence level is not optimal. They are at risk of reducing productivity as an adult. Stunting also makes children more susceptible to disease [6], [7], [8]. Stunted children are at higher risk of developing chronic diseases in adulthood. Stunting and various forms of nutritional problems are estimated to contribute to the loss of 2–3% of gross domestic product (GDP) each year [9].

The problem of stunting can have an impact on health as well as impacts on the economy. The health impacts are failure to thrive (low birth weight, small, short, and underweight), stunted children as adults, susceptible to attacks from non-communicable diseases such as heart disease, stroke, diabetes, or kidney failure; inhibits the demographic bonus in Indonesia where the ratio of the unemployed to the working age population decreases; the threat of reduced intelligence level by 5–11 points [10]. The long-term impact of stunting is Impairment of cognitive and motor development and metabolic disorders in adulthood risk non-communicable diseases (diabetes, obesity, stroke, and heart disease). The economic impact based on the research results by Brigitte *et al*. (2016) describes the average economic loss in 32 provinces in Indonesia of around IDR 96 billion–IDR 430 billion (0.15–0.67%) of the average provincial GRDP in Indonesia. Due to decreased productivity due to stunting, potential economic losses are around IDR 3057 billion–IDR 13,758 billion (0.04–0.16%) of Indonesia's total GDP [11].

The problem of malnutrition in Central Sulawesi Province based on Riskesdas (basic health

research) results was still above the national average. The stunting rate for children aged 0–23 months in Sigi district was 1199 children or 20.2%, and children aged 0–59 months were 3580 or 24.7% of children with short and very short status (2019) [12]. Whereas in the village of West Sibalaya (stunting locus village), data of 2019 showed that from 50 children, 26 children were very short and stunting (52.1% stunted). It shows that the stunting rate in the village of West Sibalaya was still high in Sigi district during the coronavirus disease 2019 (COVID-19) pandemic.

To reduce stunting children in Sigi district, the regent then made a regent decree number: 444-185 of 2020, 10 villages were designated as focus locations (LOCUS) for the acceleration of stunting reduction in 2021, namely, Lemosiranindi, Pelempea, Morui, Marena, Siwongi villages, Rantewulu, Waturalele, Langko, South Sibalaya, and West Sibalaya. In the 1st year, Sigi district, as a stunting locus district, has carried out actions 1–7.

In this pandemic, nutrition interventions are still being carried out in the stunting locus, sensitive nutrition interventions, and specific nutrition interventions. However, several implementation challenges are the absence of a strategy to accelerate the stunting prevention of pandemic, crisis, and disaster situations.

This study aims to determine the relationship between specific and sensitive nutritional interventions with children's nutritional status under five in the village of West Sibalaya, a stunting locus village, during the COVID-19 pandemic.

Methods

This type of research was a descriptive analytic study with a cross-sectional research design. This research was conducted in October 2020–November 2020 in the village of West Sibalaya, a stunting locus village in Sigi district. The population of this research is 35 mothers who have children under five in West Sibalaya Village, the Kamathipura Community Health Center, in 2020. The sample in this study was the entire population (total sampling) of 35 mothers.

The research variables are as follows:

1. The dependent variable in this study was nutritional status. The nutritional status of a child was showing a state of balance in the form of variable body weight according to age (BW/A), height or body length according to age (BH/A), and weight according to body length or height (BW/BH)
2. Independent variables were specific and sensitive nutrition interventions. The specific nutritional intervention model was a direct activity to overcome stunting, such as food intake, infection, maternal nutritional status, infectious diseases, and environmental health. The supplemental feeding sector generally provided this specific model of intervention. Sensitive nutrition interventions were indirect efforts made to prevent and reduce nutritional problems (stunting). These activities were generally carried out by the non-health sector, including providing clean water, poverty reduction activities, and women empowerment.

This study used the Chi-square test with a significance level of $p < 0.05$ with SPSS computer software.

Results

Respondent characteristics

Table 1 shows that of the 35 respondents, 45.7% were young adults (21–30 years), and 11.4% were young (<20 years). The majority of respondents had low education, 51% primary school and 40% junior high school. As for the number of children or parietal, most of the respondents had enough children, 1–2 people.

Table 1: The characteristics of the respondents

Characteristics of the respondents	n	%
Age of respondent		
<20 years	4	11.4
21–30 years	16	45.7
>30 years	15	42.9
Education		
Elementary school	18	51.4
Junior high school	14	40.0
Senior high school	3	8.6
Parietal		
<2	24	68.6
≥2	11	31.4

The nutritional status of the respondent's child

Table 2 shows that out of 35 children under five, whose nutritional status based on the BW/A index was still children who very underweight and underweight (63.8%). Based on BH/A, there were still children who

Table 2: Children nutritional status based on the anthropometric index

Nutritional status category	n	%
Weight for age		
Severely underweight	2	5.7
Moderately underweight	20	57.1
Normal	13	37.1
Body length or height for age		
Severely stunted	2	5.7
Stunted	8	22.9
Normal	25	71.4
Height or body length for body weight		
Severely wasted	6	17.1
Wasted	14	40.0
Normal	15	42.9

very short and short (28.6% stunting). Based on the BW/BH index, there were still toddlers with 17.1% severe malnutrition and 40.0% malnutrition.

Relationship between specific nutritional interventions and nutritional status

Table 3 shows that out of 35 children under five, 63.2% of children with specific nutritional interventions were not good enough and lack nutritional status (based on body weight/age). However, 62.5% of children with the specific nutritional interventions were good, but their nutritional status was not good. Based on the results of bivariate analysis for specific nutrition interventions with body weight/age, the results obtained were p = 0.98 (p > 0.05). It indicated that there was no relationship between specific interventions and nutritional status of body weight/age. Likewise, with BH/A results obtained p > 0.668 (P > 0.05) and BW/BH results obtained p = 0.968, which indicated no significant relationship between specific nutritional interventions and nutritional status.

Table 3: Specific nutritional interventions and nutritional status

Specific nutrition interventions	Weight for age				Total		p-value
	Bad		Good				
	n	%	n	%	n	%	
Bad	12	63.2	7	36.8	19	100	0.968
Good	10	62.5	6	37.5	16	100	
Total	22	62.9	13	37.1	35	100	
Specific nutrition interventions	Body length or height for age				Total		p-value
	Stunting		Normal				
	n	%	n	%	n	%	
Bad	6	31.6	13	68.4	19	100	0.668
Good	4	62.5	12	37.5	16	100	
Total	10	28.6	25	71.4	35	100	
Specific nutrition interventions	Height or body length for body weight				Total		p-value
	Bad		Good				
	n	%	n	%	n	%	
Bad	10	52.6	9	47.4	19	100	0.968
Good	10	62.5	6	37.5	16	100	
Total	20	62.9	15	37.1	35	100	

The relationship between sensitive nutrition interventions and nutritional status

Table 4 shows no relationship between sensitive interventions and children's nutritional status because most of them had been well implemented. However, there were still children who were malnourished.

Table 4: Nutrition sensitive interventions and nutritional status

Nutrition sensitive interventions	Weight for age				Total		p-value
	Bad		Good				
	n	%	n	%	n	%	
Bad	3	60.0	2	40.0	5	100	1.000
Good	19	63.3	11	36.7	30	100	
Total	22	62.9	13	37.1	35	100	
Nutrition sensitive interventions	Body length or height for age				Total		p-value
	Stunting		Normal				
	n	%	n	%	n	%	
Bad	1	60.0	4	40.0	5	100	1.000
Good	9	63.3	21	36.7	30	100	
Total	10	28.6	25	71.4	35	100	
Nutrition sensitive interventions	Height or body length for body weight				Total		p-value
	Bad		Good				
	n	%	n	%	n	%	
Bad	2	40.0	3	60.0	5	100	1.000
Good	18	60.0	12	40.0	30	100	
Total	20	62.9	15	37.1	35	100	

The bivariate analysis results showed that specific nutritional interventions had no significant relationship with nutritional status (p > 0.05) as well as sensitive nutrition interventions with nutritional status had no significant relationship (p > 0.05).

Discussion

During the COVID-19 pandemic, posyandu (Integrated Healthcare Center) activities were still running but not maximally because border residents visited Posyandu as well as officers. It is recognized that effective interventions are urgently needed to reduce stunting and need to be implemented on a sufficient scale, about a quarter in the short term. Specific interventions that have the most significant potential to reduce the morbidity and mortality burden for children are counseling about breastfeeding and fortification or supplementation of Vitamin A and zinc. Substantially, increasing complementary feeding through strategies such as nutrition education and nutritional counseling and dietary supplements in food insecure areas can reduce stunting and disease-related burdens [13], [14]. For sensitive (long term) stunting reduction interventions, it must be complemented by improvements in determinants of nutrition such as poverty, low education, disease burden, and a lack of women's empowerment [14], [15].

UNICEF's conceptual framework shows that nutritional problems are caused by direct causes, indirect causes, and root causes [3]. Overcoming this nutritional problem requires cross-sectoral cooperation through specific and sensitive nutrition intervention efforts [13]. The first 1000 days of life movement also uses specific nutrition interventions and sensitive nutrition. It is believed that sensitive nutrition interventions contribute 70% and specific nutrition interventions contribute 30% in overcoming nutritional problems [16].

Maternal education, family income, and maternal knowledge about nutrition are related to the incidence of stunting in children under five between rural and urban areas [17]. Addressing malnutrition in children requires an integrated approach that can improve the overall socioeconomic well-being of the family, mother's education, and knowledge of optimal nutrition practices, along with adequate maternal nutrition [18]. The promotion of complementary feeding practices suitable for children is currently only partially implemented [19].

To overcome this problem, the role of government and village is significant. During the pandemic, the maximum role of village was marked by the village head's involvement as a policymaker, front guard, and the closest to the community to prevent stunting. The village head has budgeted for stunting

prevention activities through funds sourced from the village fund, such as the activities of posyandu to prevent stunting, providing additional food, increasing cadres' capacity, providing clean water, and environmental sanitation is further strengthened [6].

Ten specific nutrition interventions have been proven globally (The Lancet Maternal and Child Nutrition Series) in 2013 as essential for overcoming malnutrition (The Lancet, 2013). Four further interventions are deemed necessary for specific nutrition interventions. Of the 14 interventions, only 9 are national programs, 2 interventions that are partially implemented, and 3 interventions that are not currently national policies. Specific nutrition interventions based on global evidence need to be reflected in the health sector's minimum service standards and implemented through complete nutrition services at the regional level. At least 10 essential nutrition interventions should be incorporated into national policies and guidelines and reflected in the full coverage of services provided at the local level [13], [19].

This research's weakness is that the research was carried out in the COVID-19 pandemic. Even though nutrition interventions were still carried out, sensitive nutrition interventions and specific nutrition interventions were still carried out. However, its implementation has several challenges: The absence of a strategy to accelerate stunting for a pandemic situation. The implementation has not been optimal due to limited meetings to avoid transmission of COVID-19. Even in providing extra feeding to stunting children, villages and health centers try to make bird-houses (feeding houses) for food distribution in stunting children.

Conclusions

The implementation of specific nutrition interventions has not been maximized, such as giving Taburia (micronutrient powder), which was not implemented. It was due to no procurement and no malnutrition management due to the COVID-19 pandemic. Hence, many programs did not run optimally. This study shows no relationship between specific and sensitive nutrition interventions with the nutritional status of children under five in the stunting locus village, West Sibalaya village.

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