COMPARISON OF NUTRITION STATUS OF CHILDREN WITH AGED 1-2 YEARS IN COASTAL AND URBAN AREAS

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ABSTRACT

Background: Stunting, a chronic malnutrition of children, remains a global health concern. In Indonesia, around 37% (almost 9 million) of children under five are stunted. The difference in the prevalence of stunting in coastal and urban areas needs attention for the comprehensive handling of stunting. This study aimed to analyze the comparison of nutritional status in coastal and urban areas for toddlers aged 1-2 years.
Subjects and Method: This was a cross-sectional study conducted at coastal and urban areas, Tarakan, North Kalimantan from October to November 2016. A total of 94 toddlers aged 1-2 years was selected by total sampling. The dependent variables were dietary intake and nutritional status. The independent variables were living in coastal and urban areas. The data were collected using questionnaires. The data were analyzed by independent t-test.
Results: Mean of nutritional status of toddlers in urban area was higher (Mean= -4.24; SD= 1.27) than in coastal area (Mean= -3.17; SD= 1.14), and it was statistically significant (p= 0.002). There was no significant difference in dietary intake of toddlers between coastal and urban areas.
Conclusion: There is significant difference of nutritional status in toddlers aged 1-2 years between coastal and urban areas.

Keywords: nutritional status, dietary intake, coastal, urban, toddlers

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BACKGROUND

Stunting worldwide is estimated to occur in 26% of children under five. Riskesdas (2013) showed that the prevalence of childhood stunting in Indonesia was around 37.2%, and 19.6% was malnourished. Stunting will impact the level of intelligence and are more susceptible to disease and increase poverty and, widen inequality with various factors that affect the incidence of stunting (Jiang et al., 2015).

The physical growth pattern of children is one of the tools used to assess. Physical growth itself is governed by two factors: genetics and the environment. However, the quantity and quality of food are the main environmental determinants of good child nutrition, physical, and psychosocial.

The environment also has an impact on children's growth so that it can cause stunting. Health problems for children living in low-income environments increase the risk of malnutrition and disease due to environmental conditions that are not environmental children's nutritional status. Coastal areas have characteristics and unique natural resources.

As a fish-producing area, coastal areas can improve health status, especially nutritional problems, including stunting and malnutrition, but the incidence of stunting in coastal and even urban areas still occurs (Mayasari et al., 2018). Factors of maternal height (height <145 cm), low maternal education, maternal age <20 years and ≥35 years,

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lack of knowledge, and maternal attitudes negatively affect the incidence of stunting.

Level of education cause stunting due to the lack of a mother's ability to receive nutrition information, Another factor is the high maternal weight <145 cm for the pathological condition (such as hormone deficiency) and increase the chances of passing the gene so that children grow up to be stunting (Onis and Branca, 2016).

Lack of knowledge related maternal health and environmental hygiene behaviors affect the occurrence affects infectious diseases and infectious of having a child with stunting diseases, such as of a lack of maternal attention on children's nutritional needs.

Also explained, stunting is affected by giving complementary breastfeeding too early (Mohamed et al., 2015). Mothers with socio-economic factors and environmental factors can affect the nutritional status of children under 5 years of age. Besides, the level of education in coastal and urban communities with various education levels ranging from primary to tertiary education can affect attitudes, thinking patterns, and behavior of the community, especially mothers in managing nutrition in children.

The study results showed that stunting in coastal areas is influenced by poor parenting, insufficient levels of energy, protein and zinc (Femidio and Muniroh, 2020). This study aimed to investigate the comparison of the nutritional status of children aged 1-2 years in coastal and urban areas.

SUBJECTS AND METHOD

1. Study Design

This study was a comparative analytic study with a cross-sectional design conducted in Tarakan City, North Kalimantan, from October to November 2016.

2. Population and Sample

This study's source population were all children aged 1-2 years in Tarakan City, North Kalimantan Province. A total of 94 study subjects were selected using the total sampling method.

3. Study Variables

The dependent variables were dietary intake and nutritional status. The independent variables were living in coastal and urban areas.

4. Operational Definition of Variables

Nutritional status is the physical condition of children under five, determined based on anthropometric measurements of body weight according to body length for age then interpreted by WHO - NCHS standards, measured by a questionnaire and a stature meter.

Nutritional intake is the intake of food consumed by children every day, starting from breakfast to dinner be-fore bed with categories based on the value of energy, protein, carbohydrates and fat, measured by a recall 1x24 hour.

5. Data Analysis

Univariate analysis was conducted to see the frequency distribution and percentage of characteristics of research subjects. Bivariate analysis was conducted comparing nutritional status and nutritional intake of children aged 1-2 years in coastal and urban areas using the chi-square.

6. Research Ethics

Research Ethics, among others, with the approval of the study (informed consent), no name (anonymity), confidentiality (confidentiality), and the approval of ethics (ethical clearance).

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RESULTS

1. Sample Characteristics

Based on Table 1, most of the study subjects with secondary education in urban areas were 31 (63.3%) and in coastal areas as many as 21 (46.7%). Income characteristics, most of them had low income, which in the urban as much as 28 (57.1%) and on the coastal as much as 24 (53.5%). Most of them had sufficient knowledge in the urban as much as 27 (55.1%) and in the coastal area as much as 27 (60 %).

Table 2 showed that the urban group with SD 1.27 and mean -4.24 and the coastal group with SD 1.14 and mean -3.17. The test chi-square results showed differences in the nutritional status of children aged 1-2 years in coastal areas and urban areas. It was statistically significant with p = 0.002.

Table 3 showed that the urban group's energy sufficiency (Mean= 10471.38; SD= 1219.12), the coastal group (Mean= 11525.74; SD= 3269.48). The chi-square results showed no difference in nutritional intake for children aged 1-2 years in coastal areas and urban areas with p = 0.209. The adequacy of protein in the urban group was Mean= 393.88; SD= 11247 and the coastal group Mean= 440.52; SD= 3269.48. The chi-square results showed no difference in the nutritional intake of children aged 1-2 years in coastal areas and urban areas with p = 0.443.

Adequacy of fat in the urban group Mean= 378.00; SD= 88.12 and the coastal group Mean= 444.78; SD= 174.89. The chi-square results showed no difference in nutritional intake for children aged 1-2 years in coastal areas and urban areas with p = 0.223. Carbohydrate adequacy in the urban group was Mean= 1374.50; SD= 206.51, and the coastal group was Mean= 1430.70; SD= 495.51. The chi-square results showed no difference in the nutritional intake of children aged 1-2 years in coastal areas and urban areas with p= 0.718.

Table 1. Sample characteristics (categorical data)

Variables	Residential			
	Urban		Coastal	
	n	%	n	%
Education				
Low	8	16.3	23	51.1
Medium	31	63.3	21	46.7
High	10	20.4	1	2.2
Total	49	100.0	45	100.0
Income				
Low	28	57.1	24	53.3
High	21	42.9	21	46.7
Total	49	100.0	45	100.0
Knowledge				
Good	10	20.4	8	17.8
Sufficient	27	55.1	27	60.0
Less	12	24.5	10	22.2
Total	49	100.0	45	100.0

Table 2. Differences in nutritional status (z score) children aged 1-2 years living in urban and coastal areas

Group	N	Mean	SD	p
Urban	49	-4.24	1.27	0002
Coastal	45	-3.17	1.14	

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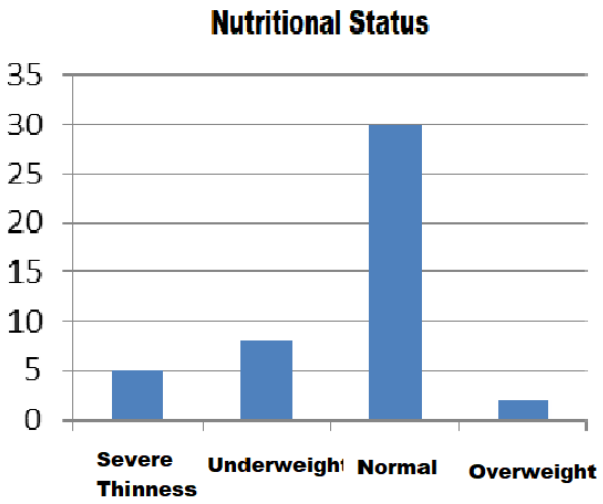

Figure 1. Nutritional status in urban

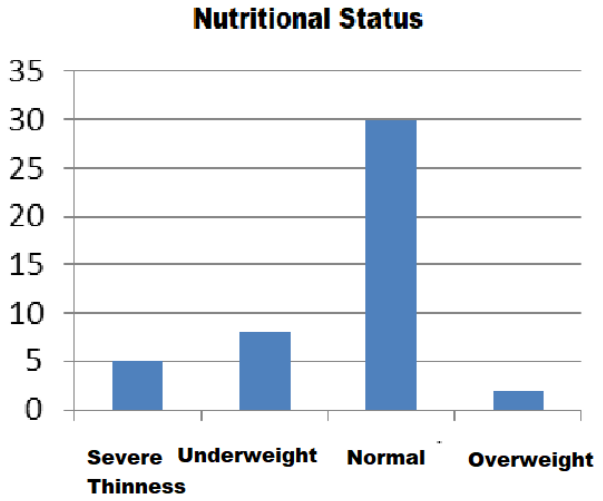

Figure 2. Nutritional status at the coast

Table 3. Nutritional intake based continuous data

group	N	Mean	SD	p
Adequacy of energy				0209
Urban	49	10471.38	1219.12	
Coastal	45	11525.74	3269.48	
Sufficiency Protein				0443
Urban	49	393.88	112 469	
Coastal	45	440.52	176.43	
Adequacy Fat				0223
Urban	49	378.00	88.12	
Coastal	45	444.78	174.89	
Adequacy Carbohydrate				0718
Urban	49	1374.50	206.51	
Coastal	45	1430.70	495.51	

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Table 4. Comparison of Nutritional Intake for Age 1-2 in Coastal and Urban Areas

Nutritional Intake	Group		p
	Urban (n = 49)	Coastal (n = 45)	
Energy Adequacy			
Good (≥80-100%)	29	28	0.459
Moderate (80-90 %)	11	5	
Less (70-80%)	4	6	
Deficit (<70%)	5	6	
Adequacy of Protein			
Good (≥80-100%)	45	41	0.388
Moderate (80-90%)	1	1	
Poor (70-80%)	3	1	
Deficit (<70%)	0	2	
Adequacy of Fat			
Good (≥80-100%)	29	25	0.721
Moderate (80-90%)	8	7	
Poor (70-80%)	4	2	
Deficit (<70%)	8	11	
Adequacy of Carbohydrates			
Good (≥80-100%)	20	23	0.448
Moderate (80-90%)	6	7	
Less (70-80%)	6	2	
Deficit (<70%)	17	13	

Table 2 showed the majority of the nutritional intake of children aged 1 -2 years showed the same results, namely in urban areas and in coastal areas with good nutrition. Nutritional intake seen from the energy adequacy value is the nutritional intake of good children, as many as 29 children in urban areas and 28 children in coastal areas with the results of the chi-square test showed no significant difference (p= 0.459), based on the protein adequacy value is the good nutritional intake, as many as 45 children in urban areas and 41 children in coastal areas, the results of the chi-square test showed no significant difference (p= 0.388). The adequacy of good fats, namely 29 children in urban areas and 25 children in coastal areas, with the test results chi-square showing no significant difference (p= 0.721) and the last analysis is based on the adequacy of carbohydrates, the majority with adequate nutritional intake, namely 20 children in urban areas and 23 children in coastal areas with the results of the test chi-square showing no significant difference (p= 0.448).

DISCUSSION

1. Comparison of nutritional status of children aged 1-2 years in coastal and urban areas.

The results showed a significant difference between nutritional status in coastal and urban areas for children aged 1-2 years. Stunting is the body's inability to achieve optimal growth due to sub-optimal health and/or nutritional status (Rahmadi, 2016).

This result is in line with the study conducted by Chowdhury et al. (2018) stated that children under 5 years of age are at risk for stunting. The environment is one of the influencing factors. Socio-economic factors can also increase the incidence of stunting due to a lack of ability to meet needs, including food needs to maintain nutritional status. This study indicates that children in coastal areas are 27.8% more stunted than

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those who live in urban areas, especially because they consumed non-iodized salt.

The results of other studies show that 80% of children in coastal areas consume fish 3 times per week, but the prevalence of stunting in coastal areas can still occur. Maternal age is one of the factors causing high stunting in coastal areas. The management of malnutrition must be expanded to reduce the rate of stunting optimally. Socio-economic factors are one of the important factors. This intervention in fishing communities needs to be adjusted to utilize fish and other available food sources to improve children's nutrition (Bandoh et al., 2018).

Underweight is associated with lower parental education, low parental income, consumption of non-iodine salt because it can cause stunting if not appropriately handled. The risk of infectious disease will increase the morbidity and mortality of children with stunting. The appropriate handling strategy needs to be adequately implemented through efforts to detect early stunting and improve children's nutritional status (Chuc et al., 2019). Stunting causes detrimental effects on short-term and long-term health problems, including increased susceptibility to infections and disorders of the child in brain development (Prendergast and Humphrey, 2014; (LaBeaud et al., 2015).

2. Comparison of Nutritional Intake of 1-2 years of age in Coastal and Urban Areas

The results show no significant difference between the nutritional intake of children aged 1-2 years in coastal and urban areas. Stunting is a complex condition that may reflect overall etiology, such as lack of breastfeeding in the first months of life, a poor and unbalanced diet and/or insufficient intake of vitamins, both micronutrients, and macronutrients. Indirect factors also have a lot of influence on the occurrence of stunting, thus affecting the unhealthy growth of children, namely lack of access to health care, education, employment, political stability, networks social support, urbanises in urban areas and environmental conditions (Vonaesch et al., 2017).

This study's results were in line with the results of research by Ernalia et al. (2018), which showed no difference in nutritional intake between stunting and non-stunting children ($p= 0.070$). Still, there was a significant difference in the mean protein intake between stunted and non- stunting children ($p <0.001$). Low protein intake was a risk factor for stunting. One of the factors that may lead to low intake and nutritional status is low income which causes the family to be unable to meet energy and nutritional needs. Therefore, the family's economic status is one of the factors that affect children's nutritional status in coastal areas. Early detection is needed to reduce the incidence of stunting, especially during the first 1,000 days of life (Weatherspoon et al., 2019).

Huda et al., (2018) explained that knowledge of mothers who are less related to the behavior of the health and environmental hygiene affects the occurrence of infectious diseases as well as working mothers at risk of having a child with stunting because of a lack of maternal attention on the nutritional needs of children so that the child's nutriational needs are lacking both the needs of carbohydrates, protein, fat and energy intake.

Simbolon Hapsari (2018) explained that low consumption of iodine in children under five years could be followed by low intake of other nutrients such as carbohydrates, protein, and fat. Foods containing high amounts of iodine usually contain high amounts of protein, such as fish, shrimp, oysters, and seaweed. If carbohydrates and fats are not available for energy production,

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thyroxine will cause protein as an energy source and impact stunting.

Conversely, carbohydrates, fats, and amino acids are present in excessive amounts in extracellular fluid. In that case, thyroxine will increase the protein synthesis rate. It becomes overweight. Sufficient carbohydrates, fats, amino acids, and thyroid hormones are needed to increase the effect of growth hormone in the pituitary on growth to be significant and prevent stunting.

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