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Relationship between Energy Intake and Diarrhea with Stunting Incidence in Children Age 0-59 Months in Lhokseumawe City

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Abstract

The research objective is analysis of relationship between energy intake and diarrhea with stunting incidence in children age 0-59 months in Lhokseumawe City. This research is an observational study using a cross sectional design. Population of this study is children age 0-59 months who are in Lhokseumawe City which is 8,025 people. Sample in this study amounted to 199 children age 0-59 months. Data on nutrient intake was obtained using a food recall form, while direct data related to infectious diseases and stunting were obtained using a questionnaire. This study uses bivariate analysis. Bivariate analysis is performed using chi-square test. The results show that there is a significant relationship between energy intake and diarrhea with stunting incidence in children age 0-59 months in Lhokseumawe City.

Keywords
energy intake; diarrhea; stunting incidence

I. Introduction

Nutritional problems are serious problems that occur in the world today, there are still many countries experiencing problems of low nutritional status and also excess nutrition. The development of a nation related to human resources is closely related to nutrition, because nutrition is central to human development. Nutritional problems in general most often occur in toddlers, because toddlers grow the fastest compared to other age children so they need more nutrition for growth and development. The nutritional problem that is the focus of health development that must be addressed today is the problem of stunting.

Stunting is a global problem, especially in many developing countries and is the main focus of the World Health Organization (WHO) (Kementerian Kesehatan, 2018). WHO in its 2006 publication stated that there are 154.8 million (22.9%) children under five in the world experiencing stunting, 90 of which are in African and Asian countries. It is currently estimated that 87 million children under five in Asia are stunted. Based on its work plan, WHO has set stunting as a priority for world health development, and has set a global target to reduce the incidence of stunting in under-fives by 40 percent by 2025 (World Health Organization, 2006). Meanwhile, the United Nations Children's Fund (UNICEF) stated that 80 percent of stunting children are found in 24 developing countries in Asia and Africa. Indonesia is the fifth country with the highest prevalence of stunting after India, China, Nigeria and Pakistan. Indonesia is one of three countries with a high prevalence of stunting in Asia. The stunting prevalence rate in Indonesia is 8.9 million or one in three children under five suffer from stunting, this means that more than one third of children under the age of five years are below the average (Kementerian Kesehatan, 2018).

The incidence of stunting or stunting is a major problem faced by Indonesia. Based on nutritional status monitoring data for the last three years, the prevalence of stunting is highest compared to other nutritional problems such as undernutrition, thinness and obesity. The Ministry of Health states that as many as three out of 10 Indonesian children are short. Stunting is a major threat to the quality of Indonesian human resources, as well as a threat to the nation's competitiveness (Kementerian Kesehatan, 2018). Efforts to reduce the prevalence of stunting under five have succeeded as much as 6.4 percent, from 37.2 percent to 30.8 percent, but have not yet reached the target of the 2015-2019 Medium Term Development Plan, namely the target of reducing stunting prevalence to 28 percent in 2019.

Stunting is a condition of failure to thrive in children under five due to chronic malnutrition, especially in the first 1,000 days of life. The condition of failure to thrive in children under five is caused by a lack of nutritional intake for a long time and the occurrence of repeated infections, and these two factors are influenced by inadequate parenting, especially in the first 1,000 days of life (Bappenas, 2018). Stunting can occur as a result of malnutrition problems starting from the period of conception until the child is two years old (the first 1,000 days of life) which is a critical period, and also in mothers before and during pregnancy (Kementerian Kesehatan, 2018). The incidence of stunting at the age of under two years illustrates the possibility of an ongoing growth failure process. Meanwhile, children over the age of two years describe having experienced growth failure (Fikawati, 2016).

Stunting or shortness is a linear growth retardation that has been widely used as an indicator to measure the nutritional status of individuals and community groups. Stunting has a range between -3 SD to less than -2 SD. The growth and development of a child can be controlled from an early age, monitoring the growth of toddlers is very important from the start to detect growth disorders (Syafrudin et al., 2009).

Stunting caused by multifactor interactions, inadequate food intake and or the occurrence of infectious diseases in children is a direct cause of parenting (United Nations Children's Fund, 2013). Stunting is also caused by insufficient nutritional intake in the long term, resulting in a slowdown in growth and affecting nutritional status.

The impact of stunting in the short term will affect the development of children under five, high morbidity and disability rates, impaired physical growth and metabolic disorders in the body, while the long-term impact is seen as short in adulthood, so that cognitive abilities are limited, reproductive disorders and increased risk of degenerative diseases such as obesity, diabetes and heart disease (World Health Organization, 2016). Toddlers or under-fives (infants under the age of two years) who experience stunting will have a lower level of intelligence, making children more susceptible to disease and in the future they can be at risk of decreased productivity. In the end, stunting will broadly hamper economic growth, increase poverty and widen inequality, thereby reducing 10 percent of total lifetime income and also causing inter-generational poverty (Tim Nasional Percepatan Penanggulangan Kemiskinan, 2017).

Good food intake is an important component in children's growth because it contains sources of macro (energy, protein, and fat) and micro (vitamins and minerals) nutrients. Inadequate energy intake can lead to a prolonged energy imbalance causing nutritional problems. Toddlers with low energy intake levels affect the function and structural development of the brain and result in stunted growth and cognitive development. Protein is a nutrient needed by the body for growth, building body structure (muscle, skin, and bone) and as a substitute for worn out tissue (Almatsier, 2006). Stunting is closely related to the need for nutrients during growth such as energy, protein and micronutrients.

Children who experience a lack of energy will have a 2.7 times risk of being stunted compared to children who have enough energy. Toddlers who have a low level of protein

intake have a 4.23 times risk of causing stunting in toddlers. There is a significant relationship between protein intake and the incidence of stunting in toddlers, children with low protein intake have a 3.42 times risk of becoming stunted. Children aged two to five years in Kenya and Nigeria, inadequate protein intake is associated with stunting.

Micronutrient deficiency is one of the factors that influence the incidence of chronic malnutrition. The most important micronutrient deficiencies in stunting toddlers are zinc, calcium, vitamins A, and D. Zinc intake is very important for children under five because it plays an active role in the process of cell division, growth, and regeneration. Zinc is closely related to bone metabolism, so that a lack of zinc can inhibit growth and development which can cause stunting in toddlers and children.

Calcium is one of the most abundant minerals in the body and is needed in relatively large amounts. Where in childhood calcium intake is needed for bone growth and development. Lack of calcium intake during the growth process can cause growth disorders (Almatsier, 2006).

Vitamin A deficiency affects protein synthesis and also affects cell growth, so children who suffer from vitamin A deficiency will experience growth failure (Almatsier, 2006). Vitamin A deficiency is most common, especially in children under five. In vitamin A deficiency, bone growth will be inhibited and bone shape is not normal. The problem of vitamin A deficiency is still found 50 percent of children under five have a serum retinol level of 20 mg/dl (Almatsier, 2006). Vitamin A deficiency will be fatal, because vitamin A deficiency increases the risk of death for 250 million children (World Health Organization, 2006).

Vitamin D deficiency can cause a decrease in the efficiency of calcium and phosphorus absorption. Vitamin D helps the absorption of calcium, because if calcium absorption is disturbed then growth is also disrupted. Vitamin D also helps harden bones by regulating the availability of calcium in the blood in the process of bone hardening (Almatsier, 2006).
The research objective is analysis of relationship between energy intake and diarrhea with stunting incidence in children age 0-59 months in Lhokseumawe City.

II. Research Method

This research is an observational study using a cross sectional design. Cross sectional design is a study to study the correlation between risk factors by approaching or collecting data at one time only (Octiva et al., 2018; Pandiangan, 2018).

Population of this study is children age 0-59 months who are in Lhokseumawe City which is 8,025 people. Sample is part of the number and characteristics possessed by the selected population following certain procedures so that it can represent the population (Asyraini et al., 2022; Octiva, 2018; Pandiangan, 2015). Sample in this study amounted to 199 children age 0-59 months.

Data on nutrient intake was obtained using a food recall form, while direct data related to infectious diseases and stunting were obtained using a questionnaire. The questionnaire is a technique of student understanding which is carried out with written communication (Jibril et al., 2022; Pandiangan et al., 2018; Pandiangan, 2022).

This study uses bivariate analysis. Bivariate analysis in this study was conducted to determine the relationship between the independent variable and the dependent variable, as well as to answer the hypothesis formulation that had been formulated previously (Octiva et al., 2021; Pandiangan et al., 2021; Pandia et al., 2018). Bivariate analysis is performed using chi-square test. Chi-square test is a type of non-parametric comparative test that is carried out

on two variables, where the data scale of the two variables is nominal (Pandiangan et al., 2022; Tobing et al., 2018).

III. Discussion

3.1 Description of Research Site

Lhokseumawe City is one of the municipalities in Aceh Province, the Unitary State of the Republic of Indonesia which was formed in 2001 as a result of the division of North Aceh Regency, Lhokseumawe City is a lowland area with an average height of 24 meters above sea level with a land area of 181.06 km^2. Astronomically, Lhokseumawe City is located between 4º54' North Latitude – 5º18' North Latitude and 96º20' East Longitude – 97º21' East Longitude. Meanwhile, geographically, Lhokseumawe City has the following regional boundaries:

1. North bordered by the Strait of Malacca.
2. The south is bordered by North Aceh Regency.
3. East is bordered by North Aceh Regency.
4. West borders with North Aceh Regency.

Weather and climate conditions in Lhokseumawe City, the average minimum air temperature in 2021 is 22^0C and the maximum air temperature reaches 34^0C. The average air humidity in 2021 ranges from 81% to 87% with an average air pressure ranging from 1,009 mbar to 1,011 mbar. While the average rainfall in 2021 is around 117 mm/month.

The total population in Lhokseumawe City in 2021 is recorded at 210,177 people, consisting of 104,691 male residents and 105,486 female residents (sex ratio=99).

In the health sector, Lhokseumawe City has a number of Health Facilities and Infrastructure including Hospitals, Polyclinics, Main Public Health Centers and Sub-Health Centers as well as Integrated Service Post.

In addition, the City of Lhokseumawe has a number of medical personnel tasked with serving the health needs of the residents of Lhokseumawe City including doctors, nurses, midwives, pharmacists, and nutritionists to medical technicians.

3.2 Bivariate Analysis

Chi-Square Test

Table 1. Chi-Square Test

Variable	P-Value
Energy Intake	0.001
Diarrhea	0.002

The results show that there is a significant relationship between energy intake and diarrhea with stunting incidence in children age 0-59 months in Lhokseumawe City.

IV. Conclusion

The results show that there is a significant relationship between energy intake and diarrhea with stunting incidence in children age 0-59 months in Lhokseumawe City.

The problem of stunting can be overcome if there is cooperation between all parties, both families of toddlers to improve the availability of family food and parenting practices related to feeding practices, personal hygiene and health to tackle stunting, so the suggestions that need to be taken are as follows:

1. For the Community
   In particular, mothers should be careful in ensuring nutritional intake for children, especially sources of energy, protein, zinc, vitamins A, and D. Mothers can process various types of nutritious dishes that can attract the attention of families, especially toddlers, to eat them, for example fish processed into fish nuggets or fish nuggets meatballs so that the family does not feel bored to eat nutritious food. From now on, mothers are expected to pay more attention to and change parenting patterns that have been wrong so far, related to feeding practices, personal hygiene and health because good parenting patterns must be supported by families, especially mothers to support the growth and development of toddlers so that they can be achieved optimally stunting does not continue into adulthood which can lead to stunting across generations and begin to increase quality intake of various nutrients to meet the nutritional needs of toddlers, maintain cleanliness and from now on take advantage of existing health services so that children's health and growth can be monitored.
2. For the Health Workers
   In order to always provide the best service, especially for mothers and their toddlers, such as by providing good assistance and socialization related to the dangers of stunting and the factors that can cause stunting including lack of nutritional intake and various types of infectious diseases so that they can help reduce the incidence of stunting in children, especially the toddler age group (0-59 months).
3. For Further Researchers
   Especially those who conduct research with the same theme, namely the relationship between nutrient intake and infectious diseases with the incidence of stunting in toddlers in order to further enrich and expand the scope and limitations of their research, such as by conducting research on factors not examined in this study so that they can contribute wider field of science, especially in the field of public health disciplines.

References

Almatsier, Sunita. (2006). Prinsip Dasar Ilmu Gizi. Jakarta: Gramedia Pustaka Utama.

Asyraini, Siti, Fristy, Poppy, Octiva, Cut Susan, Nasution, M. Hafiz Akbar, & Nursidin, M. (2022). Peningkatan Kesadaran Protokol Kesehatan di Masa Pandemi Bagi Warga di Desa Selamat Kecamatan Biru-biru. Jurnal Pengabdian Kontribusi (Japsi), 2(1), 33-36.

Badan Perencanaan Pembangunan Nasional. (2018). Pedoman Pelaksanaan Intervensi Penurunan Stunting Terintegrasi di Kabupaten/Kota. Jakarta: Bappenas.

Fikawati, Sandra. (2017). Gizi Anak dan Remaja. Depok: Rajawali Pers.

Jibril, Ahmad, Cakranegara, Pandu Adi, Putri, Raudya Setya Wismoko, & Octiva, Cut Susan. (2022). Analisis Efisiensi Kerja Kompresor pada Mesin Refrigerasi di PT. XYZ. Jurnal Mesin Nusantara, 5(1), 86-95.

Kementerian Kesehatan. (2018). Laporan Hasil Riset Kesehatan Dasar (Riskesdas) Nasional 2018. Jakarta: Balitbang Kemenkes RI.

Octiva, Cut Susan. (2018). Pengaruh Pengadukan pada Campuran Limbah Cair Pabrik Kelapa Sawit dan Tandan Kosong Kelapa Sawit terhadap Produksi Biogas. Tesis. Medan: Fakultas Teknik, Program Studi Teknik Kimia, Universitas Sumatera Utara. https://repositori.usu.ac.id/bitstream/handle/123456789/12180/157022002.pdf?sequence=1&isAllowed=y.

Octiva, C. S., Irvan, Sarah, M., Trisakti, B., & Daimon, H. (2018). Production of Biogas from Co-digestion of Empty Fruit Bunches (EFB) with Palm Oil Mill Effluent (POME): Effect of Mixing Ratio. Rasayan J. Chem., 11(2), 791-797.

Octiva, Cut Susan, Indriyani, & Santoso, Ari Beni. (2021). Effect of Stirring Co-digestion of Palm Oil and Fruith for Biogas Production to Increase Economy Benefit. Budapest International Research and Critics Institute-Journal, 4(4), 14152-14160. DOI: https://doi.org/10.33258/birci.v4i4.3521.

Pandia, S., Tanata, S., Rachel, M., Octiva, C., & Sialagan, N. (2018). Effect of Fermentation Time of Mixture of Solid and Liquid Wastes from Tapioca Industry to Percentage Reduction of TSS (Total Suspended Solids). IOP Conference Series: Materials Science and Engineering, 309, 012086. DOI: 10.1088/1757-899X/309/1/012086.

Pandiangan, Saut Maruli Tua. (2015). Analisis Lama Mencari Kerja Bagi Tenaga Kerja Terdidik di Kota Medan. Skripsi. Medan: Fakultas Ekonomi dan Bisnis, Program Studi Ekonomi Pembangunan, Universitas Sumatera Utara. https://www.academia.edu/52494724/Analisis_Lama_Mencari_Kerja_Bagi_Tenaga_Kerja_Terdidik_di_Kota_Medan.

Pandiangan, Saut Maruli Tua. (2018). Analisis Faktor-faktor yang Mempengaruhi Penawaran Tenaga Kerja Lanjut Usia di Kota Medan. Tesis. Medan: Fakultas Ekonomi dan Bisnis, Program Studi Ilmu Ekonomi, Universitas Sumatera Utara. http://repositori.usu.ac.id/bitstream/handle/123456789/10033/167018013.pdf?sequence=1&isAllowed=y.

Pandiangan, Saut Maruli Tua, Rujiman, Rahmanta, Tanjung, Indra I., Darus, Muhammad Dhio, & Ismawan, Agus. (2018). An Analysis on the Factors which Influence Offering the Elderly as Workers in Medan. IOSR Journal of Humanities and Social Science (IOSR-JHSS), 23(10), 76-79. DOI: 10.9790/0837-2310087679. http://www.iosrjournals.org/iosr-jhss/papers/Vol.%2023%20Issue10/Version-8/K2310087679.pdf.

Pandiangan, Saut Maruli Tua, Resmawa, Ira Ningrum, Simanjuntak, Owen De Pinto, Sitompul, Pretty Naomi, & Jefri, Riny. (2021). Effect of E-Satisfaction on Repurchase Intention in Shopee User Students. Budapest International Research and Critics Institute-Journal, 4(4), 7785-7791. DOI: https://doi.org/10.33258/birci.v4i4.2697.

Pandiangan, Saut Maruli Tua, Oktafiani, Fida, Panjaitan, Santi Rohdearni, Shifa, Mutiara, & Jefri, Riny. (2022). Analysis of Public Ownership and Management Ownership on the Implementation of the Triple Bottom Line in the Plantation Sector Listed on the Indonesia Stock Exchange. Budapest International Research and Critics Institute-Journal, 5(1), 3489-3497. DOI: https://doi.org/10.33258/birci.v5i1.4016.

Pandiangan, Saut Maruli Tua. (2022). Effect of Packaging Design on Repurchase Intention to the Politeknik IT&B Medan Using E-Commerce Applications. Journal of Production, Operations Management and Economics (JPOME), 2(1), 15–21. http://journal.hmjournals.com/index.php/JPOME/article/view/442.

Syafrudin, et al. (2009). Kebidanan Komunitas. Jakarta: EGC.

Tobing, Murniati, Afifuddin, Sya'ad, Rahmanta, Huber, Sandra Rouli, Pandiangan, Saut Maruli Tua, & Muda, Iskandar. (2018). An Analysis on the Factors Which Influence the Earnings of Micro and Small Business: Case at Blacksmith Metal Industry. Academic Journal of Economic Studies, 5(1), 17-23. https://www.ceeol.com/search/article-detail?id=754945.

Tim Nasional Percepatan Penanggulangan Kemiskinan. (2017). Perencanaan Penanggulangan Kemiskinan di Indonesia. Accessed at www.tnp2k.go.id at 8 Oktober 2019.

United Nations Children's Fund. (2013). Improving Child Nutrition, the Achievable Imperative for Global Progress. New York: United Nations Chilren's Fund.

World Health Organization. (2006). Standar Antropometri Penilaian Status Gizi Anak. Keputusan Menteri Kesehatan Republik Indonesia. Jakarta: World Health Organization.