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Determinants of Nutritional Status of Primary School Children in Sangir Batang Hari District, Solok Selatan, West Sumatra, 2012

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Abstract

Stunting is described as the nutritional status of primary school children with a shortage of energy and protein. Identifying factors associated with nutritional status is essential to avoid or reduce determinant factors and assumed to facilitate better advocacy in this district. This study aimed to assess the determinants of nutritional status of primary school children in *Sangir Batang Hari District, Solok Selatan,* West Sumatra, 2012. This research used a Cross-sectional community-based study that was conducted from January to July 2012 at three randomly selected primary school in *Sangir Batang Hari district, Solok Selatan*, West Sumatra. Quantitative data was gathered from 114 primary school children and their mothers. Chi-Square analysis was made to obtain p-value and confidence interval of statistical associations. 55.3% of respondents with high knowledge, 20.2% of respondents with food resistant household, 32.5% of the respondent with good energy intake, 90,4% of respondents with good protein intake, and 52.6% of respondents with normal nutritional status (Height/ Age). There was a significant relationship between energy and protein intake with nutritional status of primary school children, and there was no significant relationship between levels of mother knowledge and food security with nutrient intake of primary school children. The public health department and agriculture department must increase their cooperation in teaching their society to use the yard of the house to farming, and school health unit in primary school must always give health education to the students.

Keywords: nutritional status; primary school children

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1. Introduction

"Health development is an effort to fulfill one of the basic rights of the people, namely the right to produce health services." [1]. Health development should be a source for improving the quality of human resources and supporting the nation's economic growth and has an essential role in poverty reduction efforts in society.

Improving the quality of human resources in Indonesia is an absolute necessity in realizing the national goal of improving human resources. Efforts to improve the quality of human resources began with the fulfillment of basic human needs with the development

of child development since conception until reaching young adults. At this growth stage, the achievement of primary children such as care and nutritious food is given correctly and adequately to form a healthy and productive human resource [2].

"Children as an asset of human resources and future generations need to give birth to their life. Enough nutrition and food are one of the factors in the development of the quality of human resources." [3] Adequacy of nutrients significantly affect intelligence and productivity of human labor in children. Many aspects that affect the nutritional status of children include issues of food consumption, infectious diseases, household food security, and mother care.

The relevance of human resources with the needs of calories and protein is a positive correlation. Deficiencies of some nutrients such as energy and protein have been known to cause damage to somebody functions such as the eyes, bones, and brain that reduce the ability to work and think. This low ability directly affects the little ability to achieve technology [4].

Primary school children (6-12 years old) are among those who are in a period of rapid and active growth. At this age children more activities, both at school and outside a school, so that children need more energy. Child growth is slow but sure, according to the amount of food the child consumes. In this condition, the child should get adequate food intake of nutrients in terms of quantity and quality. "The nutritional status of children as a reflection of nutritional adequacy is an important benchmark for assessing the state of growth and health status." [5]

The nutritional intake of primary school children in some areas of Indonesia is very apprehensive. An excellent dietary intake per day is needed so that children have better growth, health and intellectual ability to become the next generation of the nation that can compete with other countries.

Based on the study of 220 children in 5 (five) primary schools in Jakarta in 2007 the caloric intake of children is generally below 100 percent of their needs, 94.5% consume calories below the adequacy limit, iron by 91.8% and zinc by 98.6% under necessity [6].

Health and nutrition problems significantly affect students learning abilities. Malnutrition in a child will affect until they grow in adults. Stunting is the most common symptoms in children with energy and protein deficiency [4].

Nutritional problems are caused by many factors that are interconnected either directly or indirectly — directly influenced by infectious diseases and inadequate dietary intake in quantity and quality, while indirectly affected by the coverage and variety of health services, insufficient child care patterns, poor sanitary conditions, and low food security at household level. As the central issue in the community is the low level of education, knowledge and skills and the level of income society [9].

2. Methods

This research used cross-sectional design and conducted in January-July 2012 at Primary Schools (SDN 01, SDN 02 and SDN 07) Sangir Batang Hari District of South Solok Regency. The population of the study was all students of grade IV and V at SDN 01, SDN

02 and SDN 07 Sangir Batang Hari District of Solok Selatan Regency, which amounted to 172 people and their mothers. The study sample was 114 primary school children and 114 mothers. Sampling was done by using the Stratified Random Sampling technique. The data were collected through primary data covering height data, nutrient intake (energy and protein), mother's knowledge level and food security and secondary data covering number and name of children and general description of the school. Data were processed and analyzed by two stages: univariate and bivariate analysis using Chi-square test

3. Result

3.1. Socio-demographic characteristics of respondents (table 1)

Table 1: Socio-demographic characteristics of the respondents at Sangir Batang Hari District, 2012.

Characteristics	Frequency (n)	Percent (%)
Sex Of Children		
Male	47	41.2
Female	67	58.8
Educational status of the mother		
Illiterate	1	0.9
Primary School	37	32.5
Junior High School	50	43.9
Senior High School	23	20.2
Diploma	3	2.6
Mother's occupation		
Housewife	89	78.1
Farmer	10	8.8
Government Employee	3	2.6
Entrepreneur	12	10.6

A total of 114 children and their mother was included in this study. More half the respondents were female (58.8%), nearly half of educational status of mothers were junior high school (43.9%), and moreover, (78.1%) of mothers occupation was a housewife.

More half (55.3%) of the mother was with high nutrition knowledge. Moreover, children (79.8%) had food-resistant households. This meant that the majority of families could not prepare balance nutrition menu, enough food, and excellent frequency for all family members because of inadequate food access. Traditional market in this area was only once in a week, with the average transaction time from 10.00 is until at 03.00 pm with limited food amount.

More half of the respondents were low energy (67.5%). It's because most of the area was not an agricultural area. People just got more rice from the traditional market once a week. Most of the children were with high protein intake because they lived in the

area near with river. People got more source of protein like fish from this river. The other protein food came from the traditional market.

TABLE 2: Distribution of mother's knowledge, food security, energy, and protein intake, and nutritional status of primary school children at Sangir Batang Hari district, 2012.

Characteristics	Frequency (n)	Percent (%)
Mother Knowledge		
High	63	55.3
Low	51	44.7
Food Security of Household		
Yes	23	20.2
No	91	79.8
Energy Intake of Children		
High	37	32.5
Low	77	67.5
Protein Intake of Children		
High	103	90.4
Low	11	9.6
Nutritional Status of Children		
Normal	60	52.6
Stunting	64	47.4

4. Discussion

4.1. The relationship of mother knowledge with intake of primary school children

Based on Table 3, mothers with low knowledge (68.6%) had children with low energy intake. The result of the statistical test obtained showed that there was no correlation between mother's knowledge level and energy intake of primary school children (p-value 0.983).

The results above did not include the nutritional content of the mother and did not always cause the child's energy intake by the recommended amount of adequacy. This evolved even though the mother knew about nutrition but could not provide food that was quite diverse and according to the needs of each family member, it's caused by the access of food that was not easy. It could be said that the attitude and behavior of mother to nutrition were not in line with knowledge of nutrition.

The results were in line with the results of research conducted by Aeda Ermawati (2003) stating there were no nutritional relationship levels of nutrients with an energy intake of children. This may be because consuming food sources of energy was a common practice in the community. So, consuming food as the community's energy source did not need specialized knowledge [27].

TABLE 3: Relationship of Mother Knowledge and food security of household With Energy Intake Of Primary School Children at Sangir Batang Hari District, 2012.

Characteristics	Energy Intake				p-value
	Low		High		
	n	%	n	%	
Mother knowledge					
Low	35	68.6	16	31.4	0.983
High	42	66.7	21	33.3	
Food security of the household					
No	63	69.2	28	30.8	0.606
Yes	14	60.9	9	39.1	

According to Hidayat (2005), low nutritional nutrition of mothers could hamper efforts to improve the excellent nutrition of the family but good knowledge could not always turn people into nutritious conscious families in the sense that not only nutrition can be overcome and should be the same to adapt this knowledge in providing and serving nutritious food for all family members [28].

The result of analysis of food security relationship with an energy intake of primary school children found that the percentage of mothers in the category of households was not food resistant whose child's energy intake is low (69.2%) higher than the percentage of mothers with food resistant household categories (60.9%). Based on the statistical test conducted, there is no significant relationship between food security and energy intake seen from p-value = 0.606 (> 0.05).

The results of this study are not in line with the theory released by the National Widyakarya Food and Nutrition VIII where food security at the household level will affect the intake of nutrients (energy, protein, fat, and carbohydrates) family members [17].

From the above research, it can be concluded that households that are food resistant do not always cause the child's energy intake to be good. This is because the kids are more snacking outside than eating at home as children who are used to skipping breakfast as well as many other factors that affect intakes such as physical activity and infectious diseases.

Table 4 shows that mothers with low knowledge level (7.8%) had children with lower protein intake than mothers with high knowledge (11.1%). Based on the statistical test conducted there is no significant relationship between the level of knowledge of mothers with protein intake seen from the value of p-value = 0.788 (> 0.05).

The results of this study are in line with the results of research conducted by Aeda Ermawati (2003) stating that there is no correlation between maternal knowledge level with child protein intake [29].

The results above illustrate that the high knowledge of mother's nutrition does not always cause the protein intake of children by the recommended protein adequacy rate. Children's protein intake is not always obtained from the food provided at home but can be derived from food snacks and PMT supplied by the school.

TABLE 4: Relationship of Mother Knowledge and food security of household With Protein Intake Of Primary School Children at Sangir Batang Hari District, 2012.

Characteristics	Protein Intake				p-value
	Low		High		
	n	%	n	%	
Mother knowledge					
Low	4	77.8	47	92.2	0.788
High	7	11.1	56	88.9	
Food security of the household					
No	9	9.9	82	90.1	1.000
Yes	2	8.7	21	91.3	

According to Notoatmodjo, environmental factors also affect a person to act. The existence of information from mass media, family, others can influence a person in behaving and acting on food intake [29].

Primary school children with households those are not more food resistant (9.9%), have children with low protein intake than households that are food resistant (8.7%). The statistical test results obtained shows there is no relationship between food security with a protein intake of primary school children (p = 1.000 / p> 0.05).

The results of this study are not in line with the theory released by the National Widyakarya Food and Nutrition VIII stating that food security at the household level will affect the intake of nutrients (energy, protein, fat, and carbohydrates) family members [17].

The results above illustrate that families with food-resistant categories do not necessarily make the protein intake of children to be good because high protein intake of children is not only obtained from food provided at home but also can be obtained from food snacks and PMT obtained in school.

Based on Table 5, it is known that children with low energy intake more (54.5%) have low nutritional status than children with good energy intake (32.4%). The statistical test results obtained shows that there is a relationship between energy intake with nutritional status of primary school children (p = 0.044 / p <0.05).

TABLE 5: Relationship of Nutrient Intake with Nutritional Status Of Primary School Children at Sangir Batang Hari District, 2012.

Intake	Nutritional Status				p-value
	Stunting		Normal		
	n	%	n	%	
Energy					
Low	42	54.5	35	45.5	0.044
High	12	32.4	25	67.6	
Protein					
Low	10	90.9	1	9.1	0.006
High	44	42.7	59	57.3	

This study is in line with research conducted by Christien Isdaryanti on protein-energy intake, nutritional status, and learning achievement of primary school students Arjowinangun I Pacitan in 2007 stating that there is a significant relationship between energy intake with nutritional status of primary school children [30]. This means children with high energy intake have normal nutritional status.

The results are by the theory by Sediaoetama stating that the nutritional status of a person is greatly influenced by the consumption of nutrients (energy, protein, fat, and carbohydrates) derived from daily food. There is no imbalance between nutrient intake with the need for nutritional problems. Low energy consumption of needs and infectious diseases is a direct cause of malnutrition [31].

Children with low protein intake more (90.9%) have stunting nutritional status than children with good protein intake (42.7%). Statistical test results obtained shows there is a relationship between protein intake with nutritional status of primary school children (p = 0.006 / p <0.05).

This research is in line with the study conducted by Andriani Elisa Pahlevi and Sofwan Indarjo on the determinants of nutritional status in 62 elementary school students at SD Negeri Ngesrep 02 Banyumanik Subdistrict Semarang City in 2011 stating that there is a significant relationship between protein intake and nutritional status of primary school children. This means that the better the protein intake of children, the better the nutritional status [28].

The source of protein consumed by many elementary school children in Sangir Batang Hari sub-district is fish. This is because of the geographical condition of the area close to the river. According to Sediaoetama, protein is an essential nutrient that is most closely related to the process-process of life. Inside the body, proteins are used for growth and repair of cells. Sufficient protein will be able to perform its function for the growth process. Sediaoetama also pointed out that animal protein has a complete array of amino acids both in terms of jummah and type. The perfect protein is a protein that is capable of supporting the growth and maintenance of tissues while vegetable protein is an imperfect protein that does not have a complete array of amino acids both in terms of quantity and type. This type of protein is not able to support the health of anyone, because it cannot replace the damaged tissue, let alone support the growth of the body. Although consumed in large quantities, the quality of these proteins will be burned to produce energy and nothing is used for the synthesis of body proteins necessary for growth or maintenance of tissue [31].

5. Conclusion

There was a significant relationship between energy and protein intake with nutritional status of primary school children, and there was no significant relationship between levels of mother knowledge and food security with nutrient intake of primary school children. The public health department and agriculture department must increase their cooperation in teaching their society to use the yard of the house to do farming, and school health unit in primary school must always give health education to the students.

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