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FAMILY CHARACTERISTIC, QUALITY OF FOOD CONSUMPTION RELATED WITH NUTRITIONAL STATUS UNDER FIVE CHILDREN

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Abstract

Introduction: Nutritional status in under five children is an important factor in the growth of children. Children's nutritional status is related to family characteristics and food intake, both qualitatively and quantitatively. Understanding the relationship between family characteristics (mother's education, knowledge and family income) and the quality of food consumption for children is an important factor in supporting optimal child growth. This study aims to determine the relationship between family characteristics (mother's education, knowledge and family income) and the quality of food consumption with the nutritional status of children under five.

Method: The research design used was a cross sectional approach, this study involved 148 children aged 2-5 years, the child's data was asked to the guardian in this case the subject's mother. Characteristics data was obtained by using a questionnaire, while data on the quality of food consumption was assessed using the Balanced Nutrition Index (IGS). Data analysis in this study used Spearman's Rank to test the relationship.

Result: The results of data analysis showed that there was a relationship between nutritional status (height of age) and quality of food consumption (p=0,000 ' r=0,334) and mother's education (p=0,000 ; r=0,335), while total family income and mother's nutrition knowledge were not related to nutritional status.

Conclusion: There is a significant relationship between mother's education and quality of food consumption with nutritional status (height of age) of under five children.

Keyword: nutritional status, under five children, quality of food consumption

INTRODUCTION

Both direct and indirect influences affect children's nutritional status. The primary factors that influence nutritional status are direct ones, such as food intake and infectious illnesses. Parenting style, food accessibility, family income, or socioeconomic level of the family are examples of indirect causal factors. In early life, the mother's role has a significant impact on children's food consumption since she sets the children's decisions and dietary preferences (Camfferman et al., 2019).

The quality and quantity of food consumption in children's must be considered as an effort to achieve a good nutritional state (Khomsan et al., 2013). Based on the results of Agustia and Sitasari research (2013), It is well known that the majority of kids consume the recommended amounts of nutrients, but the quality of their diets still needs to be improved because most kids consume low-quality food, particularly in the vegetable, fruit, and food source groups, which contain fat. According to a number of previous studies, children between the ages of 2 and 12 do not consume enough food to adequately meet their daily nutritional needs, particularly for micronutrients (Blaney et al., 2015; Citra Agustia & Sitasari, 2013; Hardiansyah et al., 2015). In addition, 14 out of 17 studies conducted in developing countries found that the index of food quality is positively related to a measure of child growth, so the findings of this study may be a concern that children in developing countries need appropriate treatment related to improving the quality of food consumption (Marshall et al., 2014) because if it is not handled properly, children in developing countries are at risk of experiencing malnutrition.

To determine whether the quality of food consumed is appropriate given the recommended food consumption section of the 2013 General Guidelines for Balanced Nutrition, various Indonesian Healthy Eating Indexes, also known as the Balanced Diet Index (BDI) or Balanced Nutrition Index (IGS), have been developed in Indonesia (PUGS). Hardiansyah (2015) has developed various alternative IGS models with the principle of preparation referring to PUGS for children aged 2–12 years. The development of a balanced nutrition index for children in Indonesia refers to the development of a balanced nutrition index for adult men and women, which has been carried out by Amrin et al. (2013) and has been adapted to the 2014 balanced nutrition guidelines (Hardiansyah et al., 2015; Primadala Amrin et al., 2013). We want to know how family traits, food intake quality, and young children's nutritional status relate to one another. In two sub-districts of Sragen Regency, the

relationship between family characteristics, the caliber of food consumed, and the nutritional status of children under five is predicted to be explained by this study.

METHODS

1.1 Study Design and Population

The design of this study was cross-sectional. Using a purposive sampling technique, a representative sample of kids was chosen. Children 2 to 5 years old who were biological, living with family (parents), in good health for at least the previous 3 months, and residing at the research location for at least 6 months were required for inclusion. The Lemeshow algorithm was used to determine the sample size of the study, which was 148 kids. The exclusion criteria were moving, being ill, and resigning. The parents of the children, in this case the mother or caregiver who had received parental approval, gave their informed agreement in writing and verbally.

1.2 Assessment of Quality of Food Consumption

By examining how well meal choices adhere to current nutritional recommendations, an assessment of food consumption can be used to determine the sufficiency, satisfaction, and variety of food options. Data on the quality of food consumed is processed using the BNI's alternate IGS3-60 model (IGS). The most reliable and useful model for evaluating the caliber of children's food consumption is IGS3-60. IGS3-60 is a tool for evaluating food quality in Indonesia that evaluates how well children's food consumption fits within the prescribed food consumption portions of the Balanced Nutrition Guidelines (Hardiansyah, 2015). The average food recall data for two consecutive 24-hour periods is computed and then divided into six food categories, including sources of carbs, fruits, vegetables, milk, and animal and plant foods. The results of these calculations are divided into servings in accordance with guidelines for a balanced diet for kids 2 to 5 years old. The portions are then valued, with the lowest value receiving a score of 0 and the greatest receiving a score of 10. The balanced nutrition index has four categories: good, enough, less, and bad, with a maximum value of 60 and a minimum value of 0. The table below lists food consumption quality categories for kids aged 2 to 5 based on the IGS3-60.

1.3 Children Nutritional Status

The nutritional status of children under five is measured based on the 2020 Ministry of Health standards with indicators of weight for age Z-score (WAZ), height for age Z-score

(HAZ) according to the WHO Growth Chart 2005 through anthropometric measurements using secca/treading scales, and microtoise. Height was measured following a standard protocol using a microtoise to the nearest 0.1 cm. Body weight was measured using a digital scale with an accuracy of 0.1 kg. Nutritional status was calculated using the WHO Anthro 2005 software. The Z-Score calculation results were then categorized according to the 2020 Minister of Health Regulations.

1.4 Family Characteristic

Data on family characteristics such as mother's education, mother's knowledge and family income were collected using a questionnaire with interviews with mothers.

1.5 Data Analysis

A variable's description is ascertained through a univariate analysis. In this study, the quality of food consumed and the nutritional status of children under the age of five were described using univariate analysis of household variables (income, occupation, mother's knowledge, and mother's education). The data is tabulated into frequency distribution tables, grouped, and reported afterward. the Kolmogorov-Smirnov test for normalcy and the Levene-Test for homogeneity. To ascertain the association between the independent and dependent variables in this study—namely, family characteristics, the caliber of food consumed, and the nutritional health of children under the age of five—bivariate analysis will be used. The Rank-Spearman test is the statistical test employed.

RESULTS AND DISCUSSION

RESULT

The features of the subject are displayed in Table 2. The majority of the individuals (68.2%) are between the ages of 4-5, as is known. The subject's mother's education consisted primarily of middle school (77.7%), with a high school diploma. Most families (66.2%) have incomes that are equivalent to or higher than the UMK, and most mothers (66.2%) are knowledgeable about nutrition.

No children under the age of five are found to consume high-quality meals, according to Table 3. The majority of children under five (53.4%) have inadequate levels of dietary quality. According to the weight-for-age index, which is 75%, most children under the age of five have a decent nutritional status. In addition, it is known that most children have normal nutritional status based on the HAZ index (78.4%) and short category of 18.9%. The

quality of food consumption, in addition to quantitative food intake, also reveals the positive and negative aspects of a person's diet. It is well known that the majority of the respondents (53.4%), notably in terms of the variety of dietary options, have poor food consumption quality.

Table 2. Characteristic of Participants (n=148)

Variable	N	%
Gender		
Male	77	52
Female	71	48
Age		
2-3 years	62	41.9
4-5 years	86	58.1
Mothers Education		
High (University)	18	12.2
Middle (High School)	115	77.7
Low (Primary and Junior High School)	18	10.1
Family Income		
Under Minimum Payment (IDR 1.829.500)	50	33.8
Same or Above Minimum Payment (IDR 1.829.500)	98	66.2
Mothers Knowledge		
Good	98	66.2
Fair	41	27.7
Low	9	6.1

Table 3. Characteristic of Participants

Variable	N	%
Quality of Food Consumption		
Fair	18	12.2
Low	51	34.5
Severe	79	53.4
Nutritional Status		
Weight for Age (WAZ)		
Underweight	20	13.5
Well Nourished	111	75.0
Risk of Over-nutrition	17	11,5
Height for Age (HAZ)		
Stunting	28	18.9
Normal	120	78.4

Table 4 below is a table of average scores according to food sources according to the IGS3-60 Balanced Nutrition Index score, based on data from the quality of food consumption, the highest average score of food is food of animal origin, which is equal to 8.2, which means the average the subject consumes 1-2 servings of animal side dishes per day, it is recommended to consume animal side dishes based on the principle of balanced nutrition, while the smallest is the consumption of vegetables, which is 2.3, which means that the subject only consumes less than 1⁄2 portion of vegetables every day and is not in accordance with nutritional principles balanced (PMK Nomor 41 Tahun 2014).

Table 4. Quality of Food Consumption Score based on Balanced Diet Index IGS3-60

	Carbohydrate food	Vegetables	Fruits	Animal proteins	Plant proteins	milks
Mean	7.50	2.30	2.50	8.20	3.58	7.74
Median	10.00	.00	.00	10.00	5.00	10.00
SD	2.827	2.500	2.766	2.974	3.826	3.417

Table 5. Bivariate analysis between maternal education, mother's nutrition knowledge, family income, quality of food consumption toward WAZ, HAZ and WHZ

Variables	WAZ		HAZ	
	R	P	r	p
Maternal Education	0,027	0,748	0,335	0,000*
Mother's Knowledge	0,130	0,880	0,027	0,743
Family Income	0,110	0,181	0,016	0,843
Quality of Food Consumption	0,147	0,074	0,334	0,000*

Table 5 below is the relationship between family characteristics, quality of food consumption and nutritional status according to the WAZ and HAZ indices. Spearman's rank correlation results show that there is a significant relationship between mother's education variable (p=0.000; r=0.335) and quality of food consumption (p=0.000;r=0.334) with HAZ index nutritional status.

DISCUSSION

Children's enter early childhood. Some of the causes of nutritional disorders are lack of nutrition knowledge or ability to apply information about nutrition in daily life, family socio- economic and mother's education, quality of family consumption. The things mentioned above can affect the nutritional status of children"s.

a. Subject Characteristic

According to this study, some mothers (66.6%) have a high level of expertise. According to research by Sudarma et al. (2020), the majority of mothers have strong awareness of children's nutrition. Knowledge is the outcome of "knowing," which happens after individuals perceive particular objects. The five senses used by humans are used for object detecting. The degree of perceptual attention paid to the object has a significant impact on how quickly knowledge is sensed and then produced. Mothers' knowledge of nutritious foods is influenced by their level of education and employment; specifically, the more educated a person is, the easier it is for them to receive information, leading to greater understanding (Emillia, 2016; Sudarma Adiputra et al., 2020). It is known that most of the subjects have mothers with secondary education and family income above the regional minimum wage. Family income is one of the factors that can affect the nutritional status of children. Economy plays an important role in choosing nutritious food in the family (Gunardi et al., 2017). Children with families who have income above the minimum wage tend to have better nutritional status than children with lower socioeconomic status (Yanti & Fauziah, 2021). Children's depend on their mothers in the provision and selection of food, so the quality and quantity of food consumption in children's must be considered as an effort to achieve a good nutritional state (Camfferman et al., 2019; Khomsan et al., 2013).

The findings were consistent with studies by Melbye et al. (2012) and Hamner et al. (2020), which found low fruit intake in children aged 6 months to 4 years. The results also showed that the majority of food consumption was from animal sources of protein while the least was consumption of vegetables. Children were found to consume 72% of fruit and 58% of vegetables on a daily basis. Children only eat 3/4 servings of fruit and 1/2 servings of vegetables per day when expressed in serving sizes. The study's findings also revealed a significant link between kids' consumption of fruits and vegetables and their desire to eat them (Hamner & Moore, 2020; Melbye et al., 2012).

Nutritional status is directly impacted by food consumption. One of the main reasons of nutritional issues is the insufficient consumption of food in both amount and quality. The impact of food consumption is influenced by both the quantity and quality of the food consumed. Bad eating habits are frequently the root cause of poor food quality. The findings indicated that the majority of the respondents consumed low-quality food, which was consistent with studies by Agustia and Sitasari (2013) and Leal et al. (2015). It was known that their food intake needed to be changed. (Citra Agustia & Sitasari, 2013; Leal et al., 2015)

b. Bivariate Analysis

According to the research, there is a moderately significant association between children's nutritional status as measured by HAZ and the quality of food consumed (p=0.000), mother's education (p=0.000), and both. This study supports earlier studies that shown a favorable relationship between the food quality index and children's growth in size (Marshall et al., 2014) and if not handled properly, children in developing countries are at risk of experiencing malnutrition. The findings of this study are also consistent with research by Yanti (2021), which demonstrates that families with wages below the local minimum wage are more likely to have children who have nutritional difficulties. One measure of meeting family needs is family income, particularly when it comes to providing a variety of foods for young children (Yanti & Fauziah, 2021).

The quality of food consumption is very important for a person because it can affect his nutritional status (Askari et al., 2021; Hayuningtyas et al., 2021; Spyreli et al., 2022). In this study, the quality of food consumption and maternal education were significantly related to the HAZ index. These results were in line with Iftikhar's research (2017) that maternal education was significantly related to stunting problems in children (Iftikhar et al., 2017) In addition, social influences also determine the nutritional state of children. According to WHZ, nutritional status is unrelated to food quality intake, but Wahyuningsih's research indicated that children who consume better-quality food typically have good nutritional status (Wahyuningsih et al., 2020). Poor eating habits usually lead to low food quality consumption, which has no relationship to changeable body weight. However, when low food quality consumption persists for an extended period of time, it can lead to growth disorders in children, specifically interrupted linear growth as a result of malnutrition for an extended period of time.

CONCLUSION

Education and quality of food consumption are significantly related to children's nutritional status according to the HAZ index. This is a key factor that must be addressed for the prevention or improvement of chronic malnutrition in children.

RECOMMENDATION

It is very important to launch sustainable programs at the national and regional levels to improve education for women as an effort to combat the burden of malnutrition in society.

REFERENCES

Askari, M., Daneshzad, E., Naghshi, S., Bellissimo, N., Suitor, K., & Azadbakht, L. (2021). Healthy eating index and anthropometric status in young children: A cross-sectional study. Clinical Nutrition ESPEN, 45, 306–311. https://doi.org/10.1016/j.clnesp.2021.07.030

Blaney, S., Februhartanty, J., & Sukotjo, S. (2015). Feeding practices among Indonesian children above six months of age: A literature review on their magnitude and quality (part 1). In Asia Pacific Journal of Clinical Nutrition (Vol. 24, Issue 1, pp. 16–27). HEC Press. https://doi.org/10.6133/apjcn.2015.24.1.13

Camfferman, R., Cornelia Van Der Veek, S. M., Christian, R., Rippe, A., & Mesman, J. (2019). Index terms: health cognitions, child overweight, feeding practices, eating styles. In J Dev Behav Pediatr (Vol. 40). http://journals.lww.com/jrnldbp

Citra Agustia, F., & Sitasari, A. (2013). Konsumsi Zat Gizi Makro, Mikro dan Kualitas Diet Pada Anak Usia 1-5 Tahun di Desa Sumampir Kabupaten Banyumas: Studi Deskriptif. Jurnal Pembangunan Pedesaan, 13(1), 11–16.

Emillia, R. (2016). Kajian Pola Asuh Kesehatan, Asupan Gizi, dan Status Gizi Pada Anak Balita, Anak Usia Sekolah, dan Remaja [Thesis]. Institut Pertanian Bogor.

Gunardi, H., Soedjatmiko, S., Sekartini, R., Medise, B. E., Darmawan, A. C., Armeilia, R., & Nadya, R. (2017). Association between parental socio-demographic factors and declined linear growth of young children in Jakarta. Medical Journal of Indonesia, 26(4), 286–292. https://doi.org/10.13181/mji.v26i4.1819

Hamner, H. C., & Moore, L. v. (2020). Dietary quality among children from 6 months to 4 years, NHANES 2011-2016. American Journal of Clinical Nutrition, 111(1), 61–69. https://doi.org/10.1093/ajcn/nqz261

Hardiansyah, A. (2015). Alternatif Indeks Gizi Seimbang untuk Menilai Kualitas Konsumsi Pangan Anak Usia 2-12 Tahun di Indonesia [Thesis]. Institut Pertanian Bogor.

Hardiansyah, A., Hardinsyah, & Sukandar, D. (2015). Alternative Indices for the Assesment of nutritional Quality of Balanced Diet of Indonesian Children 4-6 Years Old. Pakistan Journal of Nutrition, 4(10), 716–720.

Hayuningtyas, A., Dewi, Y. A., Octavia, L., Pulungan, A., & Agustina, R. (2021). Dietary quality score is positively associated with serum adiponectin level in Indonesian preschool-Age children living in the urban area of Jakarta. PLoS ONE, 16(2 February 2021). https://doi.org/10.1371/journal.pone.0246234

Iftikhar, A., Bari, A., Bano, I., & Masood, Q. (2017). Impact of maternal education, employment and family size on nutritional status of children. Pakistan Journal of Medical Sciences, 33(6). https://doi.org/10.12669/pjms.336.13689

PMK Nomor 41 Tahun 2014, Pub. L. No. Nomor 41, Hukor Kemkes RI 86 (2014).

Khomsan, A., Anwar, F., Hernawati, N., Suhanda, N. S., & Oktarina. (2013). Tumbuh Kembang dan Pola Asuh Anak (Pertama, Vol. 1). IPB Press.

Leal, K. K., Schneider, B. C., França, G. V. A., Gigante, D. P., dos Santos, I., & Assunção, M. C. F. (2015). Diet quality of preschool children aged 2 to 5 years living in the urban area of Pelotas, Brazil. Revista Paulista de Pediatria, 33(3), 311–318. https://doi.org/10.1016/j.rpped.2015.05.002

Marshall, S., Burrows, T., & Collins, C. E. (2014). Systematic review of diet quality indices and their associations with health-related outcomes in children and adolescents. Journal of Human Nutrition and Dietetics, 27(6), 577–598. https://doi.org/10.1111/jhn.12208

Melbye, E. L., Øverby, N. C., & Øgaard, T. (2012). Child consumption of fruit and vegetables: The roles of child cognitions and parental feeding practices. Public Health Nutrition, 15(6), 1047–1055. https://doi.org/10.1017/S1368980011002679

Primadala Amrin, A., Hardinsyah, & Cesilia Meti Dwiriani. (2013). Alternatif Indeks Gizi Seimbang Untuk Penilaian Mutu Gizi Konsumsi Pangan Pria Dewasa Indonesia (Balanced Diet Indices for the Assessment of Nutritional Quality of the Diet of Indonesian Adult Males). Jurnal Gizi Dan Pangan, 8(3), 167–174.

Spyreli, E., McKinley, M. C., & Dean, M. (2022). An online survey of dietary quality during complementary feeding; associations with maternal feeding self-efficacy and adherence to dietary recommendations. BMC Nutrition, 8(1). https://doi.org/10.1186/s40795-022-00595-8

Sudarma Adiputra, I. M., Dedy Erianto, N., Wiwik Oktaviani, N. P., & Trisnadewi, N. W. (2020). The Correlation between Mother's Knowledge Levels of Healthy Food with Stunting Cases in Children aged 2-5 Years. International Proceedings the 2nd International Scientific Meeting on Health Information Management (ISMoHIM), 748–755.

Wahyuningsih, S., Lukman, S., Rahmawati, & Pannyiwi, R. (2020). Education, Income and Parenting Style with Nutritional Status of Children"s. Jurnal Keperawatan Profesional, 1(1), 1–11. https://doi.org/10.36590/kepo

Yanti, T., & Fauziah, D. (2021). The Effect of Family Income on Stunting Incident in Preschool Children at Bogor City During COVID-19 Pandemic. In Indian Journal of Public Health Research & Development (Vol. 12, Issue 2).