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CHILDREN'S GROWTH, NUTRITIONAL STATUS, AND ITS ASSOCIATED FACTORS IN KARYAWANGI VILLAGE, INDONESIA

Oleh
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Abstract: *Stunting as national and global issue needs full attention from parents and healthcare teams. One of the precautions is to monitor children's growth and nutritional status. The aim of this study is to discover the factors that related to children's growth and nutritional status to prevent stunting from happening. This is a cross-sectional study with quantitative design and the sample is recruited by purposive sampling technique. Informed consent is obtained from participants and questionnaire from Parongpong Community Health Center is utilized. Thirty-six children become participants with acknowledgement from their parents. Most children are boys, have normal height, also adequate nutrition. Most parents have elementary school education, household income ranged from ±US$64 to ±US$128, owning health insurance, eating at least three times a day, and have balance nutrition in meals. Parental education level becomes the factor of children's growth and nutritional status in this study. Parental education level is vital to support children's growth and nutritional status. The other factors may be irrelevant or affected by environment, household ability, and cultural factors in the setting.*

INTRODUCTION

As a human being, one of our natures is being parents and to reproduce new generation to continue the legacy, the culture, and many other things. By being parents, it is important to pay attention to the growth and development of children. Based on Erik Erikson's theory, one can be considered a child in the range of age from 1 month to 18 years-old. Children's growth can be observed by their weight, height, and head circumferences, while their development can be seen by their motor, social, emotional, language, and cognitive abilities [1]. The quality of children nowadays is the indicator of our human resources quality in the future[2]. Making sure children are well grow and develop is our duty, especially for parents and healthcare team.

One of the problems related to children's growth is stunting. It is defined by height-by-age Z score more than two standard deviations below the World Health Organization (WHO) child growth standards by age and sex[3]. Stunting is usually caused by lack nutrition of pregnant mother which is continued during the 1000 days of child's life[4]. Globally, there were 162 million of below-five-age children suffered from stunting in 2012 with the prevalence are 56% in Asia and 36% in Africa[5]. In Indonesia, this has been a national issue and the president, Joko Widodo, has set a target to reduce the stunting number into 14% in 2024, while the stunting prevalence in 2021 is 54% based on World's Bank data[6].

One of the absolute factors to prevent stunting and support child's growth and development is adequate nutrition. Some efforts that can be done related to nutrition are exclusive breastfeed minimum for 6 months, application of breastfeed initiation when the child is born, the availability of food with good quality and quantity, and adequate nurturing[7]. Food can be defined as nutritious if it consists of high carbohydrates, high protein, high fibre, and low fat[8]. Adequate nutrition will prevent stunting and optimalize children's growth and development.

Aside from adequate nutrition, it is believed that there are other various factors that can contribute to children's growth. By knowing many factors, parents or healthcare teams will be able to utilize them to make children grow well. Therefore, this study is willing to discover the factors that are related to children's growth that can be used to prevent stunting and support their optimal growth.

METHOD

This study applies cross-sectional design which provides a quantitative description without any experiments related to children's growth status and its contributed factors to a population, by studying a sample of that population at one point in time. The primary purpose of this study is to discover which factor is contributed to children's growth.

The study was conducted in Karyawangi village, District 8 and 9, West Java, Indonesia. Researchers collaborated with Parongpong Community Health Center (Puskesmas Parongpong) as university's community clinical practice was held there. The community health center was assigned stunting program by government and professional nursing students were involved. The program was targeting the census of children below five-years-old, adolescents, and pregnant women to detect if stunting happened. In correlation with this study, the participants must fulfil some of the criteria, namely family who has children below five-years-old, can be boys or girls, and parents agreed to let their children to be participants. The exclusions of the criteria are (1) children above five-years-old, (2) parents refused to let their children join this study, and (3) parents were not able to communicate in Indonesian language. From 129 households, there were 30 households with total 36 children below five-years-old who joined this study. The participants, especially parents, were approached and gave their consent to join this study.

Researchers utilized a combined questionnaire which consisted of anthropometry data and questionnaire from community health center. The questionnaire was created in Google Form and it was filled by researchers during household census. Anthropometry data included height and weight of the children to obtain Height for age Z (HAZ) score and BMI for age Z (BAZ) score. HAZ and BAZ scores are measured to determine the status of children's growth. It is calculated by using WHO AnthroPlus Software and it will show the summary

statistics by describing full index distribution (-3, -2, -1, +1, +2, +3). Children with HAZ scores below -2.0 were classified stunting and those with BAZ scores of -2.0 as wasted, while BAZ scores above 1.0 as overweight[9]. HAZ scores above -2.0 and BAZ scores within -1.99 to 1.0 are classified normal.

A survey questionnaire from Puskesmas Parongpong was being used to determine factors that contribute to children's growth, namely *Survey Mawas Diri*. It will provide the data about parental education, household income, availability of health insurance, eating habit 3 times a day, and balance nutrition in meals. Parental education and household income will be filled based on the highest education level between parents and the amount of combined income if both parents work. The availability of health insurance, eating habit 3 times a day, and balance nutrition in meals will be answered by "Yes" or "No".

Following completion of census, the data in Google Form were extracted into Google Spreadsheet. Data of age, height, and weight of children were pulled to determine HAZ and BAZ score as dependent variables. The availability of health insurance, eating habit 3 times a day, and balance nutrition in meals as independent variables were also confiscated following the dependent variables. The correlation between dependent and independent variables were analyzed using Spearman Rho since data was not normally distributed. There will be correlation if the score of $\alpha \leq 0,05$.

This study was approved by Ethic Committees with letter number 262/KEPK-FIK.UNAI/EC/XII/22. Participants were explained about the purpose of this study and inform consents were obtained. All the data will be kept confidentially with specific code for each participant. Forcing to join the study was extremely prohibited which gave participants freedom to refuse in joining or withdraw from this study anytime.

RESULT AND DISCUSSION

There were 23 boys and 13 girls participated in this study and all children were below five-years-old. Resulting from HAZ score, children were classified into *Very Short* (19,4%), *Short* (13,9%), *Normal* (63,9%), and *Tall* (2,8%). While from BAZ score, they were classified into *Less Nutrition* (2,8%), *Adequate Nutrition* (61,1%), *Risk of Over Nutrition* (5,6%), *Over Nutrition* (22,2%), and *Obesity* (8,3%). The most participants were boys (63,87%) with the most common growth is *Normal* and the most common nutrition status is *Adequate Nutrition*. Data of children were presented in Table 1.

Tabel 1. Children's Gender, HAZ Score, and BAZ Score

Classification	N	%
Gender		
Boy	23	63,87
Girl	13	36,11
HAZ Score		
Very Short	7	19,40
Short	5	13,90
Normal	23	63,90
Tall	1	2,80
BAZ Score		
Less Nutrition	1	2,80
Adequate Nutrition	22	61,10

Risk of Over Nutrition	2	5,60
Over Nutrition	8	22,20
Obesity	3	8,30

According to data obtained from census, there were various parental level of education, namely Elementary School (41,7%), Junior High School (36,1%), Senior High School (13,9%), Vocational Degree (2,8%), and Bachelor Degree (5,6%). The range of monthly household income were also varied from Rp500.000 (±US$32) to Rp6.000.000 (±US$384). Parents with elementary level education is the most common, while monthly household income ranged from Rp1.000.001 (±US$64) to Rp2.000.000 (±US$128) appeared the most among participants. Most of household had health insurance (61,1%), ate 3 times a day (77,8%), and consumed balance nutrition in every meal (83,3%). Those data were presented in Table 2.

Tabel 2. Parental and Household Data

Classification	N	%
Educational Level		
Elementary School	15	41,70
Junior High School	13	36,10
Senior High School	5	13,90
Vocational Degree	1	2,80
Bachelor Degree	2	5,60
Monthly Household Income		
≤ Rp500.000	1	2,78
Rp500.001 – 1.000.000	5	13,89
Rp1.000.001 – Rp2.000.000	10	27,78
Rp2.000.001 – Rp3.000.000	9	25,00
Rp3.000.001 – Rp4.000.000	6	16,67
Rp4.000.001 – Rp5.000.000	4	11,11
>Rp5.000.000	1	2,78
Availability of Health Insurance		
Yes	22	61,10
No	14	38,9
Habit of eating 3 times a day		
Yes	28	77,80
No	8	22,20
Having balance nutrition in meals		
Yes	30	83,30
No	6	16,70

Meanwhile, the correlation of HAZ score and BAZ score to other variables were presented in Table 3. The only variable that correlated into each other are BAZ score and parental educational level.

Tabel 3. Correlation Between Variables

Variables		HAZ Score	BAZ Score
Educational Level	Correlation	0.170	-0.417
	Sig. (2-tailed)	0.321	0.011
	df	36	36
Household Income	Correlation	0.203	-0.245
	Sig. (2-tailed)	0.236	0.151
	df	36	36
Availability of Health Insurance	Correlation	0.276	-0.239
	Sig. (2-tailed)	0.103	0.160
	df	36	36
Eating 3 times a day	Correlation	0.166	-0.103
	Sig. (2-tailed)	0.334	0.549
	df	36	36
Balance Nutrition Every Meal	Correlation	0.260	-0.016
	Sig. (2-tailed)	0.125	0.924
	df	36	36

The finding in this study is parental education has relationship with children's nutritional status, especially their BAZ score. BAZ score is defined as body mass index trajectories or the development of body mass index according to their age from time to time[10]. The correlation between parental educational level and BAZ score is negative which means the higher the parental educational level, the lower the BAZ score, and vice versa. This correlation is aligned with some other studies[11,12]. Educated parents would know how to prepare healthy diets for their children which prevented them from malnutrition or obese[13]. Based on parent's educational level, it also affected the tendency to have breakfast in the morning for their children and having breakfast would give more benefit to children's growth and development[14] as long as the nutrition was balanced. Most of the studies found out that maternal education would affect more since mother became the main caregiver of children in family[15]. However, this study didn't differentiate between maternal or paternal education level.

This study doesn't find any correlation between children's nutritional status and growth toward household income. This produces opposite outcome compared to most of the study[16,17] because it is believed that lower income household would buy less healthy food which may affected the dietary intake quality[18] and children's growth. However, most of the inhabitant in Karyawangi village has their own garden to plant any plants. In Sundanese culture, it is common to eat *lalapan* (raw vegetables salad with chili) in meals. Some of them also have their own farm (mostly chicken and cow). This might be the reason that household income didn't affect children's growth in this area because they are able to get food by cultivating it themselves. Another reason is most of the family are extended family which make them combine their income to provide proper nutritious food for children's growth.

Nowadays, health insurance is an important factor to get easy access to healthcare facilities. Most of the studies concluded that unavailability of owning health insurance would

give more untreated health issues like, including stunting, especially in population with low socioeconomic status[19,20]. One of the causative factors related to stunting is infection, especially enteric infection or diarrheal disease, is associated with child's growth which is listed in WHO framework[21]. However, there is no correlation between owning of health insurance towards children's growth and nutritional status that can be found in this study or other studies. In this setting of study, most of the people utilizes Puskesmas Parongpong to treat their health issue. In the community health center, people can either use their health insurance to cover the bill or remunerate only small amount for the cost (±US$0.96 for every consultation). This easy access is convenient and vital for children's growth[22].

Eating frequency and balance nutrition in every meal are crucial in children's growth and nutritional status[23–25]. Inadequate nutrition of children can affect their physical growth and also give impact to their development, intelligence, even death[26]. This study doesn't find correlation between eating frequency and balance nutrition toward children's growth and nutritional status. Some of participants would skip breakfast, but they would provide some snack for their children before lunch. The unusual frequency and balanced nutrition might be masked by the quantity of the food during meals as factor contributing in children's growth[27,28].

CONCLUSION

Parental education level is crucial to support children's growth and nutritional status. Parents with higher education level are believed to know how to prepare food for their children's health and growth. The other factors that are not related in this study might be truly irrelevant factors or affected by environment, household ability, and cultural factors in the settings. Hence, another research related to culture and environment might be needed to ensure it.

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