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ASSOCIATION BETWEEN PICKY EATER BEHAVIOR WITH STUNTING AMONG PRESCHOOL CHILDREN IN SURABAYA

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ABSTRACT

Stunting is one of the main nutritional problems in Indonesia. Stunting in children can be caused by various things. One of the problems is picky eater behavior, which often appears at preschool age. The purpose of this study was to analyze the relationship between picky eater behavior and stunting in preschool children. The study used case control design, and for the sample selection used simple random sampling technique. The population of this study was all students in PG-TK Al Irsyad Surabaya and the sample for each case and control group was 15 respondents. Nutritional status was measured using the parameters of height for age (H/A) and picky eater behavior using the Children's Eating Behavior Questionnaire (CEBQ). Data were analyzed using chi-square test. Most respondents have picky eater behavior and stunting (93.3%), followed by children with picky eater behavior and not stunting (53.3%). The results of statistical tests show that there is a relationship between stunting and picky eater behavior (p-value = 0.035). Additionally, children with picky eater behavior also have a bigger risk of stunting than children who do not (OR 12.250). So it could be concluded that stunting can be caused by various factors, one of which is picky eater behavior. The recommendation for parents to prevent picky eater behavior and stunting is they can try to use responsive feeding technique, so that children can develop good eating habits, and introduce a variety of foods since childhood.

Keywords*: nutritional status, picky eater, preschool children, stunting*

INTRODUCTION

Age 0 – 5 years is the Golden Age Period in growth (Asthiningsih & Muflihatin, 2018; Toghyani et al., 2015). Children's nutritional status is one of the most important things to pay attention to because it is an indicator for maintaining growth. According to the Global Nutrition Report, the prevalence of toddlers experiencing malnutrition globally was 22.2% with stunting nutritional status and 7.5% with malnutrition (Development Initiatives, 2018). Meanwhile, based on Ministry of Health of Indonesia in 2022 and Surabaya Health profile in 2019, the prevalence of stunting or short nutritional status according to Height for Age Z-score (HAZ) was 21,6% and 8.54%, respectively.

Stunting is a nutritional problem caused by various factors and lasts for a long period of time, so that children do not grow up optimally and are characterized by shorter heights than other children of their age (World Health Organization, 2018). Children's nutritional status, including stunting, is influenced by several factors such as maternal nutritional intake since pregnancy, infection disease history, nutritional intake of the children themselves, hygiene and environmental sanitation, parenting patterns, socioeconomic conditions, and food security level (Beal et al., 2018; Septikasari, 2018. One of the frequent eating disorders in preschoolers that may increase the risk of nutritional problems is picky eater behavior. Children with picky eater behavior that has lasted for a long time tend to have a smaller weight and height than children their age (Taylor et al., 2019). Shettiwar and Wade (2019) stated that there was a meaningful correlation between picky eater behavior and children's height growth according to age, with p-value = 0.000.

Picky eater is a term that indicates a child's behavior that tends to be selective in choosing the food to consume, eating less, and not trying a new type of food (Lam, 2015; Taylor et al., 2015). Picky eaters are a set of children who have a selective attitude or avoidance of certain foods,

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can consume food if treated by a particular serving depending on their sensory properties, and have low interest in food. In certain cases, children may experience neophobia or fear of trying new types of food that they have never tried before (Samuel et al., 2018). Children's eating habits are formed by various factors, such as family environment, influences from parents' diet, food provided at home, feeding practices, and media influences (Scaglioni et al., 2018).

Based on Surabaya Health profile in 2019, the prevalence of stunting in the Pegirian Public Health Center Surabaya's work area was one of the highest in Surabaya, which is 17.96%. The effects of stunting in children are such as disruption of brain development, decreased cognitive ability, decreased immunity, decreased productivity, increased risk of non-communicable diseases, like diabetes, obesity, heart disease, and so on (Saadah, 2020). Preliminary studies conducted at PG-TK Al Irsyad Surabaya in 2021, showed 63.8% or quite high prevalence of preschool-aged children having picky eater behavior. This study aims to analyze the relationship of picky eater behavior with stunting at PG-TK Al Irsyad Surabaya, which is still under the working area of the Pegirian Public Health Center.

METHODS

This study used a case-control study design with a sample population of all students, PG-TK Al Irsyad, aged 24 – 59 months. The variables in this study were picky eater behavior, measured with Children's Eating Behavior Questionnaire (CEBQ), and Height for Age Z-score (HAZ) for identified stunting, measured with microtoise. The entire population then went through screening to be categorized into case groups and controls according to HAZ measurements, and obtained the total respondents for each group, which are 52 for controls and 16 for cases. The calculation for minimum sample used Lemeshow's formula (1997) and obtained 15 samples for each category or 30 in total. The sample selection for the case group and control used a simple random sampling method, which are all of the respondents for each groups given a number and then drawn as many samples as needed.

The inclusion criteria for the case group in this study were 24 to 59 month old children with short or very short nutritional status according to HAZ, and for the control group are 24 to 59 month old children who have normal nutritional status according to HAZ. Meanwhile, the exclusions for both the case and control groups are the children who are 60 months old or older

The measurement of nutritional status was done by measuring the height and weight of a child using microtoise and digital scales. Then the child's height and weight data were inputted into WHO Antro applications to be classified according to their nutritional status category. The category used for stunting or HAZ measurements is very short (severely stunted) <-3SD, short (stunting) -3SDs/d <-2SD, normal -2SDs/d +3SD, and high: >+3SD (Kemenkes, 2020).

After the required number of samples were obtained, the study was continued with the scoring of picky eater behavior in 24 to 59-month-old preschool children, using the CEBQ of 35 statements (Njardvik et al., 2018; Wardle et al., 2001). The questionnaire is divided into two categories: 16 food acceptance statements and 19 food avoidance statements The questionnaire was filled out using a Likert scale ranging from 1 (never) to 5 (always). Samples are categorized as picky eaters if food avoidance scores > food acceptance (Tharner et al., 2014).

The data from all collected samples were then processed using SPSS. Data are presented in the form of frequency tables as well as cross-tabulation to analyze the relationship between the picky eater and stunting using the chi-square test. This research has been approved by the Research Ethics Commission of the Faculty of Public Health, Airlangga University, with No. 124/EA/KEPK/2022.

RESULTS AND DISCUSSIONS

Respondents Characteristics

According to Table 1, respondents in this study were mothers of the subjects or toddlers. As much as 70% of respondents' household income is equal to or greater than the Surabaya City Minimum Wage (RMW) in 2023, or as much as Rp. 4,525,479 (Decision of Governor of East

Java Number 188/889/KPTS/013/2022). Then, 19 people or the majority of respondents had higher education (63.3%) and most of the respondents or 10 people (33.3%) were self-employed.

The subjects were preschool-aged children, with a majority aged between 49–59 months (53.3%). Most of the subjects also had picky eater behavior (73.3%) based on the results of the questionnaire scoring that the mother's toddler had completed. Then, nutritional status with height parameters by age or HAZ, was used as the determining category of subjects included in the case or control.

Table 1. Distribution of Characteristics of Research Subjects and Respondents

Characteristics	Nutritional Status			
	Stunting		Normal	
	n	%	n	%
Household Income				
< RMW	5	33.3	4	26.7
≥ RMW	10	66.7	11	73.3
Mother's Last Education				
No Education	0	0	0	0
Elementary School	2	13.3	0	0
Middle High School	0	0	0	0
High School	3	20	6	40
Colleges / Universities	10	66.7	9	60
Mother's Work				
Unemployed	1	6.7	3	20
Self-employed	5	33.3	5	33.3
Employee / Worker	4	26.7	4	26.7
Civil Servants	2	13.3	1	6.7
Police / Military	0	0	0	0
Trader / Merchant	1	6.7	2	13.3
Driver	0	0	0	0
Others	2	13.3	0	0
Children's Age (month)				
24-36	0	0	0	0
37-48	7	46.7	7	46.7
49-59	8	53.3	8	53.3
Picky Eater				
Yes	14	93.3	8	53.3
No	1	6.7	7	46.7

Picky Eater Behavior

The measurement of picky eater behavior was performed using the CEBQ questionnaire. Children are declared to have picky eater behavior if the food avoidance score is greater than food acceptance. Food acceptance has sub-categories, namely enjoyment of food, emotional overeating, desire to drink, and food responsiveness. Meanwhile, the sub-categories of food avoidance are emotional undereating, food fussiness, satiety responsiveness, and slowness in eating (Domoff et al., 2015).

The sub-categories enjoyment of food and food responsiveness are described as the response to the food environment that is formed, usually seen in the nutritional status of children (Jalkanen et al., 2017). The desire to drink describes the desire to consume drinks. The satiety responsiveness describes the response to food satisfaction or the ability to control fullness and hunger (Ayine et al., 2021; Dalton et al., 2015). Slowness in eating can represent the child's interest in eating food, as seen in the duration and speed of eating (Dubois et al., 2022). Food fussiness can be used to view child responses to newly introduced foods (Dubois et al., 2022). Lastly, emotional overeating and emotional undereating sub-categories are used to view children's eating habits as a response to emotional changes experienced (Powell et al., 2017).

Table 2. Distribution of CEBQ Results

Characteristics	Nutritional Status							
	Stunting				Normal			
	Min	Max	Mean	SD	Min	Max	Mean	SD
Food Acceptance								
Enjoyment of Food (4)	9	20	13.60	2.995	8	20	13.93	4.131
Emotional Overeating (4)	4	13	6.53	2.386	4	13	7.73	3.081
Desire to Drink (3)	6	15	9.27	2.685	6	14	9.67	2.610
Food Responsiveness (5)	7	18	11.93	3.390	9	24	14.93	4.234
Food Avoidance								
Emotional Undereating (4)	4	17	11.60	3.869	4	14	10.80	2.908
Food Fussiness (6)	7	27	17.47	5.041	7	28	18.47	6.266
Satiety Responsiveness (5)	10	21	14.27	3.369	7	19	13.40	3.542
Slowness in Eating (4)	4	16	10.33	4.012	6	15	10.80	2.833

Based on Table 2, the average for food acceptance category in the control group or nutritional status normal is higher than the case group, whereas in the food avoidance category, the average group of cases in the emotional undereating and satiety responsiveness sub-categories was higher than the control group. It can be interpreted that, in the case group, children more often have a low appetite or often go down due to emotional conditions. This can also be because stunted children have a risk of developing infectious diseases so their appetite can be disrupted (Sari & Agustin, 2023).

The Relationship between Picky Eater Behavior and Stunting

According to Table 3, the total number of children with picky eater behavior is 22 people, with 14 children with stunting nutritional status (93.3%) and eight normal children (53.3%). Meanwhile, eight children do not have picky eater behavior, seven children have normal nutritional status and one child is stunting.

The results of the chi-square test between variables indicate a significant relationship between the picky eater and stunting (p-value = 0.035). Furthermore, the results showed that the risk of stunting events was greater in children with picky eater behavior than those without, indicated by OR = 12. 250.

Table 3. Association between Picky Eater Behavior with Stunting

Variables	Nutritional Status				*p value*	*OR*
	Stunting		Normal			
	n	(%)	n	(%)		
Picky eater						
Yes	14	93.3	8	53.3	0.035	12.250
No	1	6.7	7	46.7		

The results of this study are in line with Nurmalasari et al.'s (2020) research, which also stated that there is a significant relationship between picky eater behavior and stunting in 2–5 year olds in Central Lampung, with a p value = 0.000. Similarly to the study of Shettiwar and Wade (2019), there is a positive correlation between the behavior of picky eaters and the high growth of children by age, with a p value = 0.000.

This result is not in agreement with a study by Nugroho (2020) that found no significant relationship between stunting and picky eater behavior, as shown by a value = 0.741. Other studies conducted by Thi Bach Yen et al. (2019) found that picky eater behavior has no relation to stunting (value >0.05), but there is a significant relationship with wasting and underweight (value <0.001).

The cause of stunting consists of various factors such as low birth weight, recurrent and persistent infectious diseases, poor diet, long-term

intake of nutritional substances, and household poverty (WHO, 2018). Stunting can occur from the first 1000 days of life or start in the womb until the age of 2 and will continue, especially if a child's nutritional intake continues to be unfulfilled (WHO, 2018). At the age of more than 2 years, stunting children still have the possibility of catching up on growth. However, it is not uncommon for this to fail because the need for nutritional substances is obstructed by unfulfilling food, recurrent infectious disease, economic factors and so on (Scheffler et al., 2021). Therefore, the handling of stunting in the first 1000 days is prioritized, and contributions are needed from various sectors.

Parents' education, especially mothers, is one of the things that are also important to note. According to the research by Utami et al. (2019), parent education, including mother and head of family, both have influence in stunting. This is because the higher the education obtained by both parents, the easier it will be to process and implement the information gained about nutrition and health. Economic factors are also contributing to stunting and malnutrition in children (Septikasari, 2018). This is because families with low economic status have limitations on accessing more complete and diverse sources of nutritional intake (WHO, 2018).

Children's eating habits can be established by their parents' practice of feeding, including pressure, type, amount, and time of eating (Ali & Ahmed, 2022). According to Fernandez et al. *2020), picky eater behavior often occurs in preschoolers and lasts until school age. The picky eater behavior is often considered natural in children because the increasing age of this habit will decrease (Taylor & Emmett, 2019). Selective child's behavior in choosing food if it lasts for a long period of time can result in certain nutritional intakes being inadequate and may cause new nutritional problems.

Children with picky eater behavior that has lasted for a long period of time tend to have less weight and height than children of their age (Taylor et al., 2019). Some nutritional intake in picky eaters also tends to be lower than that of non-picky eaters due to the lack of diversity of food consumed daily. Macronutrients, such as energy, carbohydrates, protein, fat, and also dietary fiber in picky eater children are often found to remain satisfied but lower than those of non-picky eater children (Taylor et al., 2016; Xue et al., 2015).

In Table 2, it was found that most subjects had the highest average enjoyment of food and food fussiness. According to the results of a study conducted by Ferreira et al. (2023), food fussiness is related to the level of consumption of vegetables and fruits, as well as processed fish products. Children tend to enjoy eating energy-intensive sweet and savory foods more, but the content of other nutrients is low (Chao, 2018). Similar to the results of this study, children who behave like picky eaters tend to consume high-calorie snacks and rarely consume vegetables and fruits. Mothers also give milk more often, both formula and UHT, as a solution if children are having trouble eating.

One way to form good children's eating habits is to apply proper feeding practices. Children's eating habits can be established by their parents' practice of feeding, including pressure, type, amount, and time of eating (Ali & Ahmed, 2022; Finnane et al., 2017). Responsive feeding practices are a way of feeding children by applying disciplined and regular routines, such as getting used to eating at the same time every day, eating different foods, eating where they should, and sitting quietly without interruption from gadgets or other toys (Mallan & Miller, 2019).

Responsive feeding can also train children to respond to signals of fullness and hunger, improving their self-feeding ability and getting a good diet. Responsive feeding principles include encouraging children to eat patiently and without coercion, feeding in an appropriate and safe environment, responding to food rejection, teaching children to self-feed slowly, and feeding time being the right time to learn and love between mother and child (Hardianti et al., 2018; Pallewaththa et al., 2021). According to research conducted by Cerdasari et al. (2017) and Hardianti et al. (2018) , applying feeding patterns with responsive feeding techniques can reduce or prevent picky eater behavior in children.

However, there are still remaining controversies about the relationship between picky eater behavior and stunting. Some researchers have different arguments about this topic. This

is because of the different results they obtained about behavior in picky eaters and what they consumed. There are also biases from other factors of stunting, such as mother's diet intake since pregnancy, history of breastfeeding, dietary pattern of children, etc. This study has limitations because it was only conducted on small samples and only in one region.

CONCLUSION

Results in this study show a significant relationship between picky eater behavior in children and stunting or nutritional status according to TB/U <-2SD. Additionally, the results also show that children with picky eater behavior have a greater risk of stunting than non-picky eater children.

Parents and caregivers can create an ideal eating environment, such as using a responsive feeding technique, so that children can imitate and develop good eating habits. Introducing a variety of foods is also important since childhood, it is also necessary to make an interesting serving style of meal so that children are interested in consuming them and increasing their appetite.

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