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# The Relation Between "Picky Eating" Behavior and Nutritional Status of Pre-School Children

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## ABSTRAK

**Latar Belakang:** *Picky eating dicirikan sebagai penolakan terhadap jenis makanan tertentu. Perilaku makan ini berpotensi menyebabkan masalah pada status gizi karena asupan makan yang tidak adekuat. Status gizi yang bermasalah ini dapat menyebabkan berbagai gangguan, kekurangan gizi menyebabkan perkembangan fisik dan mental tertunda, menurunkan kapasitas intelektual dan meningkatkan kerentanan terhadap penyakit, sedangkan kelebihan nutrisi meningkatkan kerentanan terhadap penyakit metabolik dan kardiovaskular.*

**Tujuan:** *Menentukan prevalensi picky eating dan hubungan picky eating dengan status gizi anak prasekolah di Kecamatan Rajabasa Bandar Lampung.*

**Metode:** *Penelitian ini menggunakan metode kuantitatif dengan pendekatan cross- sectional. Sampel terdiri atas 160 anak prasekolah berusia 36-72 tahun (3-6 tahun) pada PAUD di Kecamatan Rajabasa Bandar Lampung. Sampel diambil menggunakan metode Multistage Random Sampling dan dianalisis menggunakan uji Chi Square.*

**Hasil:** *Sebanyak 100 anak (62,5%) teridentifikasi sebagai picky eater. Sebanyak 21 anak (13,1%) memiliki status gizi kurus berdasarkan IMT/U, 118 anak (73,8%) normal, dan 21 anak (13,1%) tergolong gemuk. Secara statistik, tidak ada hubungan antara perilaku makan picky eating dengan status gizi anak prasekolah dengan nilai p = 0,914.*

**Kesimpulan:** *Prevalensi picky eating sebesar 62,5% dan tidak ada hubungan antara picky eating dengan gizi anak prasekolah di Kecamatan Rajabasa Bandar Lampung.*

**KATA KUNCI***: picky eating; prasekolah; status gizi*

## ABSTRACT

**Background:** *Picky eating is characterized by the refusal of a certain type of food. This eating behavior potentially causes a nutritional status problem because of inadequate intake of food. This nutritional status can lead to many problems, undernutrition causes delayed mental and physical development, decrease intellectual capacity, and higher susceptibility to disease, while overnutrition increases the susceptibility of metabolic and cardiovascular diseases.*

**Objectives:** *This study aims to determine the prevalence of picky eating and the relation of picky eating behavior and nutritional status of pre-school children in Rajabasa Bandar Lampung.*

**Methods:** *This study uses a quantitative method with a cross-sectional approach. The sample consisted of 160 pre-school children aged 36-72 months (3-6 years) in kindergartens located in the Rajabasa subdistrict, Bandar Lampung. Sampling was done by multistage random sampling and the data were analyzed by chi-square test.*

**Results:** *As many as 100 preschool children (62.5%) were identified as picky eaters. A total of 21 children (13.1%) were classified as thin by BMI/Age nutritional status, 118 children (73,8%) were normal, and 21*

*children (13.1%) were overweight. Statistically, picky eating behavior is not related to the nutritional status of preschool children with a p-value = 0.914.*
***Conclusions:*** *The prevalence of picky eating is 62.5% and there is no relation between picky eating behavior and the nutritional status of pre-school children in Rajabasa Bandar Lampung.*

**KEYWORDS***: nutritional status; picky eating; preschool;*

## INTRODUCTION

The problem related to nutrition still has become a public health concern in many countries, especially in developing countries. In Indonesia, nutrition problems mostly happen in the high-risk group, such as children, eligible women, pregnant women, and the elderly. According to data by the Indonesian Ministry of Health[1] the prevalence of children whose undernutrition is 14.4%, malnutrition 3.4%, and overnutrition is 1.5%. Nutrition intake for children is not only for physiologic needs but also has an impact on psychosocial, psychodynamic development, and organic maturation (1).

The children who suffer from undernutrition are more susceptible to various diseases, such as protein-calorie malnutrition (marasmus, kwashiorkor, and marasmus-kwashiorkor), diarrhea, tuberculosis, and pneumonia as the leading cause of death in children (2). These infectious diseases can be caused by the decline of the immune system. The brain development related to children's intelligence and psychosocial development can also be disrupted by lacking nutritional intake. Children whose undernutrition tend to become less creative, less initiative, and even passive (3).

Various factors could influence children's nutritional status, namely our parent's characteristics (education level, nutritional knowledge, eating pattern, and income), affordability of information sources, health and nutritional practices, psychosocial parenting quality, and children's eating behavior (4). One of the parameters which determine the children's nutritional status is their eating behavior. This eating behavior is influenced by children's development phase. In children aged 2-3 years old, the concept of autonomy, social competence, and self-regulation process is starting to appear. The eating behavior problem is also common to happen in this phase called "picky eating" (5).

"*Picky eating*" is defined as eating behavior in infants and children in the form of eating difficulties, which commonly includes the rejection of foods without any organic abnormality. The most often form of picky eating is eating slowly (14,3%), rejecting some kind of foods, especially fruits and vegetables (14%), prefers sweet and fatty foods (13,3%), unwilling to try new foods (12%), only want to try a certain type of foods (12%) and prefers snack than the main course (11,1%) (6).

Picky eating could also be related to eating disorders in adolescents and early adults, and could happen in normally developing children or children with a development disorder. This eating disorder results from suboptimal development, and some children with picky eating are reported to have a low weight gain. Picky eating is one of the factors sectors for undernutrition since picky eaters tend to have lower calorie, protein, vitamin, and mineral intake than those who aren't picky eaters (7). Based on this background, the researchers are interested to examine further how the relation of picky eating behavior and nutritional status of pre-school children in Rajabasa Bandar Lampung.

## MATERIALS AND METHODS

This study is observational analytical

research with a cross-sectional design. This study aims to describe the prevalence of picky eating among preschool children in Rajabasa Subdistrict Bandar Lampung and analyze the relation between picky eating and the nutritional status of preschool children in Rajabasa Subdistrict Bandar Lampung. This study was done in November-December 2019, located in Kindergarten in Rajabasa Subdistrict, Bandar Lampung. The sample size was 160 preschool children and counted using an independent analytical categorical sampling formula. The sample was taken using Multistage Random Sampling. The first stage uses a cluster random sampling technique. Rajabasa sub-district is divided into clusters, namely villages. The minimum number of clusters used in this method is 25% of the total number of available clusters (8). Because there are 7 villages in Rajabasa District, 2 villages are chosen randomly. All kindergartens located in the 2 selected villages were used in the study. The second stage is to select a sample from each kindergarten. The number of samples needed in this study is 151 children and for each kindergarten, the same number of samples will be taken, therefore to calculate the number of children In each kindergarten using the formula: the number of samples divided by the number of kindergartens in 2 selected villages. The sample selection from each kindergarten used simple random sampling.

The inclusion criteria include children aged 36-72 months (3-6 years old) with approval from their parents. The exclusion criteria include the children who have undergone major surgery (heart, intestine, kidney, brain, lung, liver, and backbone), suffering from chronic diarrhea (>2 weeks) in the last month, anorexia, diabetes mellitus, chronic kidney disease, heart disease, and cancer.

The independent variable is picky eating behavior. The determination of picky eating behavior using a questionnaire adapted from the *Child's Eating Behaviour Questionnaire* (CEBQ) (9). There were 10 questions consisting of 5 questions from Food Fussiness (FF) subcategory and 5 questions from Food Responsiveness (FR)

subcategory. Respondents could choose one choice available for each question: never, rarely, sometimes, often, and always with Likert scale scoring (1-5) respectively. A child is classified as a picky eater if the total score of *Food Fussiness* is higher than Food Responsiveness and so vice versa for the non-picky eater.

The dependent variable in this study is the nutritional status with Body Mass Index for Age (BMI/Age) index. The measurement was interpreted in Z-Score according to guidelines published by the Department of Health of Republic Indonesia 2010. For children aged 36-60 months, classified as extremely underweight if <-3 Standard Deviation (SD), underweight if -3 to -2 SD, normal if -2 to 2 SD, and overweight if >2 SD. For children aged >60 months, extremely underweight if <-3 SD, underweight if -3 to -2 SD, normal if -2 to 1 SD, overweight if 1 to 2 SD, and obese if >2 SD (10).

## RESULTS AND DISCUSSIONS

Characteristics of subjects are divided into several categories, namely age, gender, and mother's occupation. The age characteristics in this study were mostly 49-72 months old, namely 147 children (91.8%). Gender characteristics found that most respondents were male as many as 83 children (51.9%) and the majority of occupational mothers worked as housewives, as many as 122 people (76.2%). Based on the results of research that have been done, the distribution frequency of preschool children that are classified as picky eating are 100 children (62.5%) and preschool children who are not picky eating are 60 children (37.5%). From 160 subjects, the nutritional status of preschool children in Rajabasa Subdistrict Bandar Lampung was: extremely underweight as many as 0 children (0%), underweight as many as 21 children (13.1%), normal as many as 118 children (73.8%), overweight as many as 21 children (13.1%) and obesity as many as 0 children (0%). Characteristics of subjects are presented in Table 1.

**Table 1. The Characteristics of Subjects**

| Characteristics | Frequency (n) | Percentage (%) |
|---|---|---|
| Age | | |
| 36-48 months | 13 | 8.2 |
| 49-72 month | 147 | 91.8 |
| Gender | | |
| Male | 83 | 51.9 |
| Female | 77 | 48.1 |
| Mother's Occupation | | |
| Housewive | 122 | 76.2 |
| Government employees | 8 | 5 |
| Teacher | 11 | 6.9 |
| Entrepreneur | 6 | 3.8 |
| Employee | 7 | 4.3 |
| Laborer | 3 | 1.9 |
| Nurse | 3 | 1.9 |
| Picky Eating | | |
| Yes | 100 | 62.5 |
| No | 60 | 37.5 |
| Nutritional Status | | |
| Extremely underweight | 0 | 0 |
| | 21 | 13.1 |
| Underweight | 118 | 73.8 |
| Normal | 21 | 13.1 |
| Overweight Obese | 0 | 0 |

Bivariate analysis was performed to determine the relation of picky eating behavior with the nutritional status of preschool children in the Rajabasa Subdistrict Bandar Lampung. The results of the analysis of eating behaviors "picky eating" with the nutritional status of preschool children in the Subdistrict of Rajabasa found that out of 100 preschool children who are picky eaters, there are preschool children who have the thin nutritional status of 13 children (13%), as many normal 73 children (73%) and fat 14 children (14%). Of 60 children who are not picky eaters (non-picky eaters) there are preschool children who have thin nutritional status as many as 8 children (13.3%), 45 children are normal (75%) and 7 children are fat (11.7 %). The statistical test using the chi-square test obtained a p-value of 0.914.

**Table 2. The Relation of Picky Eating Behavior with the Nutritional Status of Preschool Children**

| Picky Eating | Status Gizi | | | P-value | Chi-value |
|---|---|---|---|---|---|
| | Under-weight (n) | Normal n | Over-weight n | | |
| Yes | 13(13%) | 73(73%) | 14(14%) | 0,914 | 0.179 |
| No | 8(13.3%) | 45(75%) | 7(11.7%) | | |

Characteristics of respondents in this study were found to be the most aged in the range of 49-72 months (91.8%), which is the age of kindergarten/ Raudhatul Athfal (RA) / Bustanul Athfal (BA), and equivalent education units. While the age of 36-48 months is a playgroup and equivalent. At this age also the prevalence of picky eating increases (11). Based on gender data, there is almost equal distribution, 51.9% are male and 48.1% are female. This shows that boys and girls have relatively equal opportunities to become picky eating or not picky eating. This is related to the process of growth and psychological changes experienced by both boys and girls in the process of development (12).

Most of the mothers in this study were housewives or unemployed (76.2%), while the rest (23.8%) worked in various sectors, both formal and informal. A mother's occupational status can affect the nutritional status of children, both positive and negative impacts. The positive impact of working mothers is an increase in family income which increases food intake. Conversely, the mother's attention is not entirely to take care of the child, especially in preparing food needs (13).

The results show that the picky eating status variable in preschool children in the District of Rajabasa Bandarlampung, 62.5% of children were included in the picky eating category. This prevalence is not too different from research done in Semarang in 2015, which obtained the prevalence of picky eating in infants about 60.3% (14). Another study also conducted in Semarang in 2018 showed a slightly lower number, about

52.4% (7). Researchers outside Indonesia about picky eating have also been widely carried out. A study by Xue et al in China, which was done in children aged 7-12 years found a picky eating prevalence is 59.3% (15). An extremely different result was obtained by Cerdasari who researched in Yogyakarta with respondent toddlers aged 2-3 years, with a prevalence of picky eating around 2.13%. The difference in the prevalence of picky eating could be influenced by the different places of research, the characteristics of respondents, and the different methods used in determining whether children are picky eating or not (16).

Many factors determine picky eating behavior in children. This factor is a complex interaction between genetic and environmental factors that can be categorized into several groups, namely (a) genetic (influencing characteristic, neurobiological and psychological matters), (b) prenatal (sensory experience in utero; maternal nutrition), (c) experience of initial postnatal food (formula milk feeding; weaning practices), (d) family diet, (e) family environment (social, economic, number of siblings) (17).

The result shows that the nutritional status of preschool children in Rajabasa Subdistrict Bandar Lampung was found that most preschoolers had normal nutritional status (73.8%), as well as underweight and overweight is 13.1% respectively. This result is possibly caused by the better economic status of most subjects, and it's easier for parents to get the information and education about nutrition through various sources, such as television, internet, etc. so that the availability of food and parent's knowledge about nutrition is good enough (18).

A person's nutritional status depends on nutritional intake and needs, if both are balanced, it will produce good nutritional status. The nutritional requirements of each individual are different, depending on their age, gender, activity, weight, and height. Protein needs among children under five are not the same as the needs of adolescents, the energy needs of students who become athletes will be far greater than students who are not athletes. The need for iron in women of childbearing age is more than the need for male iron, because iron is

needed for red blood (hemoglobin), and because women are shedding blood every month through menstruation (19).

The bivariate analysis in this study was to know the relation between picky eating behavior and the nutritional status of preschool children in the Rajabasa Subdistrict, Bandar Lampung. The results of the analysis using the Chi-Square test obtained a p-value of 0.914, which means the value of p> 0.05, thus it can be interpreted that there is no relation between picky eating and the nutritional status of preschool children in the Rajabasa Subdistrict, Bandar Lampung.

The results of this study are consistent with Kusuma's research which researched on toddlers in the Kedungmundu Public Health Center in Semarang which obtained a p-value of 0.467 so that there was no relation between the picky eating status with the nutritional status among toddlers (14). This is also supported by the results of a study by van der Horst conducted in the District of Columbia, the United States in children aged 12-48 months (1-4 years) which found that children who are picky eating do not tend to have lower body weight (underweight) than children who are non-picky eating (20).

Picky eating behavior is a phase that often occurs in infants which do not always cause health or social problems, but the behavior of picky eating that occurs to an extreme level can be bad for growth, causing chronic illness, and even death. Picky eating behavior also causes children to have a lack of micronutrients and macronutrients, which in turn can interfere with physical growth characterized by difficulties in gaining weight, impaired cognitive growth, and poor nutrition (21). Children with picky eating behavior tend to be picky against certain foods or refuse to eat at a time, but at other times they will eat the food they declined on the previous day. Behavior of picky eaters who have a pattern like this is believed to be able to balance the calorie needs of children even if not consumed every day. And it depends on the role of the parents (22).

A study by Samuel et al found that there was no difference in macronutrient intake (carbohydrates, protein, and fat) in picky eating and

non-picky eating children. Fiber intake in children who are picky eating is lower than non-picky eating. Micronutrient intake (vitamins A, C, E, B1, B2, B3, iron, and zinc) in picky eating children is consistently found to be lower than in non-picky eating children. The types of food most often rejected by picky eating children are fruits and vegetables. Because macronutrients do not decrease, the nutritional status is not directly affected. The nutritional disorder occurs if picky eating children reject a type of food of macronutrients sources and if picky eating occurs chronically (more than 2 years) (23).

## CONCLUSIONS AND RECOMMENDATIONS

The prevalence of picky eating in preschool children is high (62,5%) although there is no relation between picky eating behavior with the nutritional status of preschool children in Rajabasa Subdistrict, Bandar Lampung. It is advisable to provide education to parents of students about feeding with the concept of balanced nutrition and introducing all types of food to children from an early age.

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