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*by* Alina Hizni

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## Research Article

# Feeding Practices and Frequency of Food Refusal in Children

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## Abstract

**Background and Objective:** Feeding is very important for growth and development of children. The aim of this study was to determine feeding practices for children and the frequency of food refusal in children. **Materials and Methods:** This study was a cross-sectional study conducted around July-August 2018. The population was mothers with children approximately 18-24 months old. A total of 74 mothers were selected by systematic random sampling. Data analysis was done using univariate and bivariate analyses. **Results:** There is a positive correlation between maternal feeding practices and the frequency of food refusal in children ( $p = 0.003$ ). Mothers who obediently provided food to their children were less likely to refuse food feeding. **Conclusion:** The results showed that food refusal in children is caused by the mothers' improper feeding practices. Therefore, the earlier proper feeding practices are instigated, the less frequent the food refusal in children will be. The expectations set for proper feeding practices can have a positive impact on improving nutrition across society.

**Key words:** Children, feeding practice, food refusal, Indonesian toddlers, malnutrition

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**Competing Interest:** The authors have declared that no competing interest exists.

**Data Availability:** All relevant data are within the paper and its supporting information files.

## INTRODUCTION

Malnutrition in toddlers is a serious health issue in Indonesia. The malnutrition rate in Indonesian toddlers has reached 19.6%. Eating difficulties and food refusal have become major issues in both the feeding process and the fulfillment of nutritional needs. These issues are generally found in children and have become a health problems throughout the world. Eating difficulties in children who are not treated immediately could cause malnutrition, dehydration, being underweight, electrolyte imbalances, cognitive developmental disorders, anxiety disorders and other severe circumstances with life threatening possibilities<sup>1</sup>. The results of Darwati *et al.*<sup>2</sup> in Jayapura showed that between 92.7 and 95.8% of children had eating problems due to inappropriate feeding practices. The prevalence of eating difficulties was 33.6 and 44.5% of all of the children suffered from mild to moderate malnutrition. Moreover, 79.2% of subjects had been suffering from eating difficulties for more than 3 months<sup>2</sup>.

The causes of eating difficulties and food refusal vary and include diseases or organic disorders that underlie biological interactions and environmental factors, especially family factors. The most common cause is a lack of nutrition intake, especially due to the composition and texture of food and the feeding rules. Eating difficulties and food refusal issues can also be caused by the mother's lack of awareness of food readiness signs in her baby. Therefore, mothers need to understand the readiness of their baby's oromotor before giving food<sup>3</sup>.

Mothers' lack of awareness of appropriate eating rules, such as how to give breast milk, complementary foods and appropriate milk formula, could cause eating difficulties in children. If a child has difficulty receiving complementary foods (ASI), this matter could cause obstacles in the transition from giving breast milk to giving other forms of food. Another risk is malnutrition, which is the most common cause of death in children under five. The behavior of the mother or caregiver, the environment and the surrounding culture also determine eating behavior of a child. Much information related to feeding children comes in the form of myths and cultures that exist in society, which, if not criticized, can have an impact on eating difficulties and malnutrition in children<sup>4</sup>.

The causes of shut tight mouth movements in children can come in many forms, including boredom, sickness, a lack of hunger and the existence of trauma related to certain foods and eating processes. Usually, parents become more permissive of their children's actions because the parents panic or are perplexed. For example, parents may let their child eat only his favorite biscuits, may only give milk as a

substitute for food or allow the child to continuously consume his favorite junk food. There are also parents who are busy looking for vitamins to increase their children's appetites, who take their children around the neighborhood during mealtimes or who let their children play while eating<sup>5</sup>.

Feeding practices during the initial feeding period for babies aged 6-12 months are part of an important phase in the growth and development of infants. Improper provision of nutrition can lead the babies to a high risk of malnutrition. The risk of malnutrition is even higher if their breastfeeding is inadequate or if their formula feeding does not follow established recommendations<sup>6</sup>.

Efforts to improve feeding practices have been carried out by the Indonesian Ministry of Health through psychoeducation, counseling and other means. All procedures were performed through networking devices of the health department, public health centers (Puskesmas) and Maternal and Child Health Services (Posyandu) but the number of impact indicators showed that the results were not optimal for improving feeding behaviors in infants. The increase in knowledge and skills must be taught directly and continuously to mothers until they reach the optimal results. Research has produced a great deal of data related to poor infant feeding practices in Indonesia<sup>7,8</sup> but more data representation of eating habits and mothers' efforts to increase the food intake of toddlers, including the fastest way to do so with baby formula, is needed. Therefore, it is important to conduct research on the factors that initiate the refusal of children to eat. The purpose of this study was to obtain data to improve eating patterns of children, reduce the frequency of eating refusal and optimize children's nutritional status.

## MATERIALS AND METHODS

**Design:** A cross-sectional study was conducted in Kejaksaan District, Cirebon, West Java, Indonesia, from September to October 2018. The study population was mothers with children aged 18-24 months old in Kejaksaan District, Cirebon, West Java. A total of 74 samples were taken using a systematic random sampling technique.

**Data collection:** The data collected contained two variables: the independent variable (mother's adherence to feeding rules) and the dependent variable (the frequency of children's food refusal). Trained enumerators made visits to the respondents' houses using the sample lists that were prepared. The enumerator read the explanation text and asked each respondent to sign the consent form if she was willing to participate in the research. The enumerator conducted screening of the subjects that met the research

inclusion and exclusion criteria. The enumerators would like to thank the respondents for their participation and for providing contact material.

**Ethical considerations:** This study was approved by the ethics review board of the Ethics Research Commission of the Tasikmalaya Health Polytechnic by Ministry of Health on August 7, 2018 (Reference: 2018/KEPK/PE/VII/0017).

**Statistical analysis:** Univariate data analysis was performed for all variables. Bivariate analysis using the Chi square test was used to examine the correlation between the independent variable and the dependent variable with a significance level of  $p < 0.05$ .

## RESULTS AND DISCUSSION

This research was conducted in Kecamatan District, Cirebon, West Java, Indonesia. The samples in this study were 74 mothers or caregivers of children. All data about mothers or caregivers and children are shown in Table 1. The mother's

Table 1: Distribution of subjects' characteristics, including mother's education, mother's occupation, child's gender, number of children, the mother's eating rules and practices and the frequency of eating rejection in children

Variables	No. of subjects (n)	Percentage
<b>Mother's education</b>		
Graduated elementary school	9	12.2
Graduated middle school	13	17.6
Graduated high school	36	48.6
Advanced academic training/college	16	21.6
<b>Mother's occupation</b>		
Civil servant	3	4.1
Trader	6	8.1
Employee	11	14.9
Housewife	51	68.9
Laborer	1	1.4
Domestic	2	2.7
<b>Child's gender</b>		
Boys	31	41.9
Girls	43	58.1
<b>No. of children</b>		
1	23	31.1
2	25	33.8
3	21	28.4
4	3	4.1
5	1	1.4
12	1	1.4
<b>Compliance with feeding rules</b>		
Compliant	52	70.3
Not compliant	22	29.7
<b>Frequency of eating rejection</b>		
Never/rarely	49	66.2
Often	25	33.8
Total	74	100.0

level of education was relatively low, with the percentage of those who were graduated only from elementary school at 12.2%. Most mothers were housewives (68.9%). Most of the children were girls (58.1%). The percentage of families with 2 children or more was 35.3%.

The independent and dependent variable data were collected as follows:

The mother's adherence to feeding rules was defined as the practice of the mother or caregiver having 20 feeding rules, which was assessed with 20 questions about schedules, procedures and the eating environment or setting<sup>9,10</sup>. A score of 1 = not/rarely done by the mother or caregiver (<3 times/week), 2 = often (3-5 times/week) and 3 = always (every day). The results of the responses from the mothers/caregivers were categorized into two categories: (1) Obedient if mother/caregiver had  $\geq 80\%$  of the maximum score (maximum score was 60) and (2) noncompliance if mother/caregiver had a score <80% of the maximum score<sup>11</sup>.

The frequency of food refusal in children on a given day was obtained by asking about the frequency of eating habits in children. The frequency of food refusal was measured by asking how many times children refused to eat within one week (seven days) according to the feeding schedule set by their mother/caregiver. A child would be classified as food refusal child if he/she refused the staple food or consumed less than 25% of the staple food that was served according to proper portioning<sup>12</sup>. The percentage of food refusal was calculated as follows:

$$\text{Food refusal (\%)} = \frac{\text{Frequency of food refusal for 7 days}}{\text{Total frequency of eating (7 days)}}$$

The percentage of food refusal was categorized as (1) never/rarely refuses to eat if <50% and (2) frequently refuses to eat if  $\geq 50\%$ .

The mothers' feeding rule practices showed that there are still rules that have not been optimally applied (Table 2). The five eating rules with the lowest adherents were as follows:

- Prepare a special napkin at meal time (6.8%)
- Mix breast milk/formula milk/broth or weaning food (13.5%)
- Insist on the main meal as the first step, then drinking is allowed (41.9%)
- Do not allow any distractions during the eating process (43.2%)
- Use special tableware (63.5%)

Table 2: Mothers' feeding practices

Feeding rules	Yes		No	
	No.	Percentage	No.	Percentage
Right on schedule	62	83.8	12	16.2
According to schedule recommendations	63	85.1	11	14.9
The process takes no more than 30 min	55	74.3	19	25.7
Not giving snacks at meals	63	85.1	11	14.9
Appropriate portion	52	70.3	22	29.7
Appropriate texture	69	93.2	5	6.8
Appropriate type	66	89.2	8	10.8
The main meal comes first and ends with drinking	31	41.9	43	58.1
Teach children to have their own meal	51	68.9	23	31.1
No coaxing or coercing	49	66.2	25	33.8
Terminate after 10-15 min of refusing to eat	49	66.2	25	33.8
Cleaning the mouth only at the end	50	67.6	24	32.4
Mixing breastfeeding milk/milk formula/broth	10	13.5	64	86.5
Do not serve leftovers	60	81.1	14	18.9
No coercion	50	67.6	24	32.4
Prepare napkins	5	6.8	69	93.2
Do not distract child	32	43.2	42	56.8
Do not persuade child	51	68.9	23	31.1
Use special cutlery	47	63.5	27	36.5
Wash hands before and after eating	63	85.1	11	14.9

Table 3: The relation between mothers' feeding rules practices and frequency of feeding rejection in children in the Kejaksaan subdistrict, Cirebon, West Java Province, Indonesia

Feeding rules practice	Eating rejection						p value
	Never/rarely		Often		Total		
	No.	Percentage	No.	Percentage	No.	Percentage	
Complying	40	76.9	12	23.1	52	100	0.003
Not complying	9	40.9	13	59.1	22	100	
Total	49	66.2	25	33.8	74	100	

Table 3 shows that 13 mothers (59.1%) whose practice of feeding rules was not adherent may cause their children to have food refusal issues. This study found that mothers who did adhere to the feeding rules tended to have children who rarely refused to eat. A chi-square test with  $\alpha = 0.005$  found a value of  $p = 0.003$ . This result shows a positive relationship between compliance by mothers with the practice of feeding rules and the frequency food refusal in children. These results are consistent with a study by Jansen *et al.*<sup>13</sup>, who reported that the Child Feeding Query (CFQ) scale greatly correlates with children's food intake and Tovar *et al.*<sup>14</sup> suggested that this type of eating style might be a risk factor for obesity.

Children are expected to have as low a frequency of food refusal as possible. The causes of eating difficulties are very diverse and include diseases or organic disorders that underlie biological interactions and environmental factors, especially family factors. The most common cause is a lack of proper

nutrition because of the composition of the food, the texture or the feeding rules<sup>7</sup>. The Indonesian population consists of diverse ethnicities with various cultures and traditions within them. Parent behavior plays the most important role in the practice of feeding children. Their actions are influenced by their own or their family's sociocultural background and values. For example, children are sometimes forced to drink herbal medicine to increase their appetite; in fact, this action may cause deep psychological trauma and may cause children to become more difficult to feed<sup>3</sup>.

Prolonged eating difficulties decrease the energy intake of children and this can affect their growth and development. Eating difficulties will first affect the weight (it will stay the same or decrease) and then affect children's height and nutrition status. Therefore, it is necessary to conduct a physical examination of their teeth, mouth and ability to swallow and to see if any neurological disorders are found that might interfere with the eating process. The various causes that are

interfering with the eating process must be detected as early as possible and immediately solved based on problems that arise<sup>15</sup>.

Some cases of eating difficulties or food refusal could also be caused by a lack of awareness on the part of the mother about the signs of food readiness in her baby. Mothers need to understand the readiness of their baby's oromotor before feeding them. Babies who refuse to eat usually show certain signs, such as responding by shutting their lips when being fed, known as mouth shut movement<sup>15</sup>, which also includes stuffing food into their mouths, turning their heads, crying and throwing the food from their mouths. Parents often blame their children for having eating difficulties. Therefore, it is likely that the parents will feel worried, especially if their children's weight does not increase. In fact, balanced nutritional intake at this age is very important for children's growth and development<sup>15</sup>.

The causes of mouth shut movement in toddlers vary and may include being bored, sick, or not hungry or having trauma related to certain foods or the eating process. Usually, parents become more permissive of their children's actions because they panic or are perplexed. For example, parents may let their children only eat their favorite biscuits, may only give milk as a substitute for food, or may allow their children to continuously consume their favorite junk food. There are also parents who look for appetite-enhancing vitamins or take their children around the neighborhood during mealtimes to let their children play while eating<sup>16</sup>.

According to a multicenter study by the Indonesian Pediatrician Association, the most common cause of mouth shut movement in children is inappropriate feeding practices, defined as improper eating behaviors or age-inappropriate feeding<sup>15</sup>. This often happens after supplementary feeding (ASI) begins or in the early weaning phase. Proper feeding must pay attention to several things, such as timeliness, the quantity and quality of the food and the hygienic preparation of food service that must be arranged in accordance with the child's developmental stage. Feeding practices that represent children's developmental stages include appropriate food textures and ratios of solid and liquid foods<sup>5</sup>.

Sucking on food is a sign of baby refusing to eat. This habit occurs because the feeding time the parent provides lasts too long. In the end, the eating process may be lasting more than 1 hour, which may happen because many parents are too focused on the quantity of the food intake. Another cause is the number of distractions happening around the children. The existence of toys, adult activities that attract the

attention of children, or television broadcasts or videos such as films, songs, or even advertisements could cause children to forget about eating or stop chewing their food. Sucking on food is also caused by food with a bad taste, such as bland or tasteless food, or by children being bored by a lack of variety in their food.

The eating process is an activity that involves two parties: the food giver (parent or caregiver) and the person who is being fed (children). The interaction that happens during the eating process is influenced by the conditions of both parties, including their temperaments, behaviors and habits<sup>13</sup>. In addition, the environment also provides different settings and results during the feeding process. The environment includes the presence of other people, toys, televisions and gadgets that are often called disruptors (distractors) during the eating process. Meanwhile the eating process is also part of the learning process<sup>17</sup>.

Children gradually learn to recognize the texture, consistency, taste, smell and type of food according to their developmental stage. There are no fixed rules for introducing food but food should be introduced according to the ability and readiness of the individual child, who may initially only be able suck and swallow breast milk but will gradually be able to savor solid food with his or her tongue and chew with his or her jaw and teeth. The feeding process starts with foods that have smooth textures and soft consistencies and that are not too tangy or strongly flavored. At 1 years old, children begin to eat the same food as their family with certain conditions, such as the meat being chopped or the texture being adjusted<sup>11</sup>.

Some myths have emerged regarding the proper process of feeding children, including serving some source of carbohydrates, postponing the provision of meat until children are 8-10 months old and postponing the provision of fish and eggs until children are 1 year old. Similar to these myths, some experts argue that there is no specific order for giving weaning food. Sources of carbohydrates, protein (meat, chicken, eggs, fish), vegetables and fruits should be given from the time children are 6 months old. Postponing the provision of fish and eggs until the child is 1 year old is not effective in preventing allergies<sup>18</sup>.

Most parents or caregivers tend to persuade and calm down their children in various ways in order to encourage their children to eat. However, all of these efforts may actually interfere with the children's state of concentration when they are eating. If children do not want to eat, parents often replace the food with excessive formula milk. This method makes the children always full and it becomes more difficult to introduce proper eating methods<sup>19</sup>.

The introduction of weaning food can be initiated when the baby shows signs of eating readiness. Most normal babies show signs of eating readiness at the age of 6 months; signs include keeping the head upright, sitting up with help, having a reduction of the reflex to stick out the tongue, showing interest in seeing other people eat, trying to reach for food and opening the mouth if offered a spoon or food<sup>10</sup>.

Efforts to prevent eating difficulties need to be made early by referring to feeding rules in the creation of childcare patterns; these rules touch on the attitudes and behaviors of mother or caregiver and their attachment to children, feeding practices, care giving, the maintenance of hygiene and demonstrations of love. A pattern of care relates to the condition of the mother or caregiver in terms of physical and mental health, nutritional status, general education, knowledge about parenting styles, roles in the family or in the community, etc.<sup>20</sup>.

The practice of following feeding rules is expected to help overcome eating difficulty issues in infants so that their growth and development improve. However, if children still have eating difficulties, then the parents are advised to directly consult a nutritionist or pediatrician to find the specific cause of the difficulties.

### CONCLUSION

The results showed a positive correlation between the practice of mothers or caregivers applying eating rules and the frequency of food refusal in children ( $p = 0.003$ ). Mothers/caregivers who obediently applied the eating rules in feeding their children will decrease the chance of food refusal.

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